Institute of policy Analysis and Research - Rwanda

3K-SAN

Catalysing Self-Sustaining Sanitation Chains in Informal Settlements

A Review and Analysis of the Situation pertaining to the Provision of Sanitation to Low-Income Settlements in Kigali City (Rwanda):

Diagnostic Report

This report was prepared by Aime Tsinda and Pamela Abbott

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Authors: Aime Tsinda, Pamela Abbott

ACRONYMS AND ABBREVIATIONS

BAD:	African Development Bank
CHC:	Community Health Centre
EDPRS:	Economic Development and Poverty Reduction Strategy
EIA:	Environmental Impact Assessment
EWSA:	Energy, Water and Sanitation Authority
EICV:	Integrated Household Living Conditions Survey
KCMP:	Kigali Conceptual Master Plan
MDGs:	Millennium Development Goals
MINAGRI:	Ministry of Agriculture and Animal Resources
MINALOC:	Ministry of Local Government
MINECOFIN:	Ministry of Finance and Economic Planning
MINEDUC:	Ministry of Education
MINELA:	Ministry of Environment and Lands
MINIJUST:	Ministry of Justice
MININFRA:	Ministry of Infrastructure
MINIRENA:	Ministry of Natural Resources
MINISANTE:	Ministry of Health
MINITERE:	Ministry of Lands
NGO:	Non-Government organizations
NISR:	National Institute for Statistics for Rwanda
PIGU:	Projet d'Infrastructure et de Gestion Urbaine
REMA:	Rwanda Environmental Management Authority
RURA:	Rwanda Utilities Regulatory Agency
SPLASH:	European Union Water Initiative Research Area Network
UNDP:	United Nations Development Programme

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EXECUTIVE SUMMARY

This diagnostic report provides a comprehensive review of what is already known about sanitation in Kigali City. It is mainly based on a literature review, supplemented by a number of key informant interviews undertaken to inform a proposed investigation of sanitation chains in Rwanda. It seeks to provide an overview of the major issues concerned with the provision of sustainable sanitation service chains in Kigali City with an emphasis on informal settlements.

Kigali City, like many other cities in developing countries, is experiencing a high rate of urbanisation. The population in Kigali City is growing faster than the provision of services, including sanitation, required to meet their needs. Much of the urban growth takes place in an unplanned way and 62.6 per cent of the population in Kigali City live in informal settlements. This lack of sanitation presents a major risk to public health. Diseases attributable to poor sanitation are increasing significantly with polluted water and poor sanitation being responsible for about 80 per cent of the disease burden on Rwandans (Lubaale and Musyoki, 2011).

Faced with this situation, some sensitisation initiatives are being made to stimulate demand. These initiatives include media campaigns and programmes targeted at communities (Participatory Hygiene and Sanitation Transformation Program, Cell Based Hygiene approach) and at schools (*Hygiene et Assainissement en Milieu Scolaire*), the creation of Community Health Workers and the creation of environmental clubs at schools and in every village. Decentralisation and community development programmes (*umuganda, ubudehe, and imihigo*) provide a way for people to increase their demands for improved sanitation.

However, demand is limited by access to finance and a reluctance to invest in rented property. On the supply side, there is little provision and there is a lack of qualified craftsmen, masons, artisans and adequate sanitary technology know-how. There are plans to build a sewage treatment plant but funding remains problematic. Once constructed, will the plant be able to take the sludge from the latrines? Access to pit emptying machines in informal settlements will be a challenge. The situation of sanitation in Kigali City would probably have been improved if legal, regulatory and institutional framework was effective. However, there is duplication of responsibilities which results in lack of clarity.

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INTRODUCTION

This report examines what is already known about the provision of sanitation in poor urban informal settlements of Kigali City (Rwanda). It analyses the social, economic, legal and policy frameworks that govern the provision of sanitation and how they facilitate or hinder access to sanitation in low-income urban communities. It is a part of 3K-SAN/SPLASH Research Project and will develop and evaluate strategies for catalysing self-sustaining sanitation chains in low-income informal settlements in Kisumu (Kenya), Kampala (Uganda) and Kigali (Rwanda). Catalysing self-sustaining sanitation chains broadly refers to improved sanitation without continued external intervention. This is very important because, generally, improved sanitation has not always been sustainable, and relying on foreign aid is not a good idea.

In Rwanda, poverty remains one of the greatest challenges facing the people and their Government. Many households do have access to improved sanitation. According to EICV3, 83.3 per cent of the households in Kigali City have access to improved sanitation (National Institute of Statistics for Rwanda, 2012b). However, the public health situation in Rwanda is greatly compromised because of inadequate sanitation and hygiene. It is argued that polluted water and poor sanitation is responsible for about 80% of the disease burden on Rwandans (Lubaale and Musyoki, 2011). The institutional framework for addressing urban sanitation and hygiene does not work for the poor and lack of infrastructure exacerbates the situation. In regards to this situation, some projects have been implemented, but not always successfully. That is why the 3K-SAN Project has decided to conduct this research because a catalysing self-sustaining sanitation chain is widely acknowledged to be an essential foundation for better health, welfare economic productivity and environmental sustainability. The project fits also with the Government's strategic priorities.

The project will help by coming up with concrete proposals for how improved sanitation can be provided in a sustainable way in informal urban areas of East Africa. The findings will be of direct benefit to informal settlement dwellers, enable Governments to reach their targets for improved sanitation and health and recognising sanitation as a human right. Recognising sanitation as a human right is an important step in motivating improvement in sanitation while catalysing self-sustaining sanitation chains by improving empting, transport, treatment, disposal and re-use services in urban areas. This acts as an engine for any development efforts and constrains progress across all the MDGs. Why? Because self-sustaining sanitation chains has the potential to catalyse a broad range of development outcomes and supports the realisation of other human rights, including the rights to education, health, adequate housing, work, food and water (COHRE, 2008). Specifically, self-sustaining chains have the potential to catalyse development and improve the quality of life by ensuring the health of citizens and limiting the burden of treating preventable illness, increasing access to education for all, promoting economic growth especially in developing countries (COHRE, 2008).

The report is divided into nine sections describing different aspects of the social and political environment that impact upon the urban sanitation sector. It begins by providing the background and context for the research (section 1) , followed by a brief, but broad overview of the socio-economic and physical conditions that exist in the Rwanda as a whole and a more detailed description of Kigali City (section 2). Section 3 provides a review of the legal, regulatory, and policy regulatory frameworks that impact directly or indirectly on the provision of sanitation. The fourth section describes the role of institutional management in the provision of sanitation services. Section five analyses the main stakeholders. The report then describes the markets for sanitation (Section 6). The seventh section deals with sanitation services provision and practices. The eighth section describes the population's attitudes and perceptions regarding sanitation. The last section deals with local initiatives and activities for improving sanitation (Section 9).

1 BACKGROUND AND CONTEXT

1.1 Definitions of key words

1.1.1 Self-sustaining sanitation chains

There are many definitions of sanitation, basic sanitation, improved sanitation and environmental sanitation, proposed by UN bodies, Water Supply and Sanitation Collaborative Council (WSSCC), Joint Monitoring Programme of UNICEF and the World Health Organization, amongst others. In Rwanda, sanitation is defined as the isolation/management of excreta from the environment, maintenance of personal, domestic and food hygiene, safe disposal of solid and liquid wastes, maintaining a safe drinking-water chain and vector control(Ministry of Infrastructure, 2010). This definition is different from the one developed by the Millennium Task Force. Sanitation is access to, and use of, excreta and wastewater facilities and services that ensure privacy and dignity, ensuring a clean and healthy living environment for all (COHRE, 2008). It is this definition developed by the Millennium Task Force that has been adopted in this report. The sanitation chain goes beyond this and it clearly refers to a series of services which include the *collection, transport, treatment and disposal of human excreta, domestic wastewater and solid waste, and associated hygiene promotion',* to the extent demanded by the particular environmental conditions. It is therefore defined as *methods for the safe and sustainable management of human excreta, including the collection, storage, treatment and disposal/re-use of faeces and urine* (Evans and Tremolet, 2010).

As regards to the term *sustainable*, it has multiple dimensions. The Sustainable Sanitation Alliance (SUSANA) suggests that while the main objective of a sanitation system is to protect and promote human health by providing a clean environment and breaking the cycle of disease, in order to be sustainable, a sanitation system has to *be not only economically viable, socially acceptable, technically and institutionally appropriate, it should also protect the environment and the natural resource* (SUSANA, 2008). Self-sustaining sanitation chains in the context of informal settlements are understood here as social, financial and technological systems that together provide affordable sanitation and to improve public and environmental health without continued external intervention. In terms of faecal sludge, the sanitation chain is seen as a series of the following services: waste emptying, waste transport, waste treatment and waste disposal/re-use.

1.1.2 Right to sanitation

From a human rights point of view, sanitation must be:

- **Safe:** This requires adequate hygiene promotion and education (COHRE, 2008);
- **Physically accessible:** It means that sanitation must be accessible within, or in the immediate vicinity, of each household, health or educational institution, public places and the workplace (COHRE, 2008);
- **Affordable :** This means that sanitation must be available at a price that everyone can afford without compromising their ability to acquire other basic goods and services, including food, housing, health services and education (COHRE, 2008);
- **And culturally acceptable:** Sanitation must be of a culturally acceptable quality because in many cultures, use of toilets is a highly sensitive subject and the construction, positioning and conditions for use will need to be taken into account in planning services (COHRE, 2008).

1.1.3 Informal settlements

The definition of informal settlements is context-specific. Various definitions have been proposed, but that suggested by the UN Habitat Programme is probably the most widely applicable. Informal settlements are defined as *residential areas where a group of housing units has been constructed on land to which the occu-*

pants have no legal claim, or which they occupy illegally; unplanned settlements and areas where housing is not in compliance with current planning and building regulations (unauthorized housing) (Hofmann et al., 2008). In Rwanda's context, informal settlements (often referred to as *utujagari*) are settlements composed of poor communities and as such, these settlements are characterised by a dense proliferation of small, make-shift shelters built from diverse materials, lack of social infrastructure (potable water, sanitation facilities, roads), degradation of the local ecosystem and by severe social problems. In Kigali, 62.6 per cent of households live in informal settlements (National Institute of Statistics for Rwanda, 2012b).

1.2 Description of the Project

The 3K-SAN Project is being funded by the EU-SPLASH Consortium under their programme for sustainable sanitation research. The project aims to identify and evaluate strategies for catalysing self-sustaining sanitation chains in low-income informal settlements in African cities by addressing four major objectives:

- To map and analyse sanitation-related financial flows, stakeholder roles, regulatory frameworks and communication pathways.
- Engaging stakeholders to address social and economic barriers to sanitation provision.
- Building capacity for research in sanitation in East Africa, and for poverty reduction, through facilitated sanitation development in low-income and vulnerable communities.
- Production and dissemination of appropriate guidance packages on stimulating demand for improved sustainable sanitation services in low-income informal settlements.

The project is being implemented in three cities that face major challenges in providing sustainable access to water and sanitation for their rapidly expanding populations: Kigali (Rwanda); Kisumu (Kenya); and Kampala (Uganda). The similarities and differences between the provision, management, and regulation of sanitation will be analysed using innovative social and legal research methods. Best practice guidelines for the implementation of sustainable sanitation will be produced as a major output from the project.

1.3 Importance of the project

- Through the participatory rapid appraisal, the 3K-SAN Project will work with poor communities in selected sites to identify barriers and develop acceptable and affordable solutions and promote demand;
- Through deliberative forums and focus groups, the 3K-SAN Project will bring the private sector and civil society to increase their interests in removing faecal sludge from household level and to generate affordable improved sanitation;
- Though expert interview with government officials and international experts, 3K-SAN Project will come up with regulation relevant to right to sanitation.

1.4 Sites selected for fieldwork

Two sectors have been selected for fieldwork in the City of Kigali. These two sites are Gatsata and Kimisagara. The figure 1 shows the location of Gatsata and Kimisagara. Gatsata and Kimisagara are "*informal settlements*" situated at the western edge of Kigali. While Gatsata is situated at North-West, Kimisagara is situated at South-West (Figure 1).

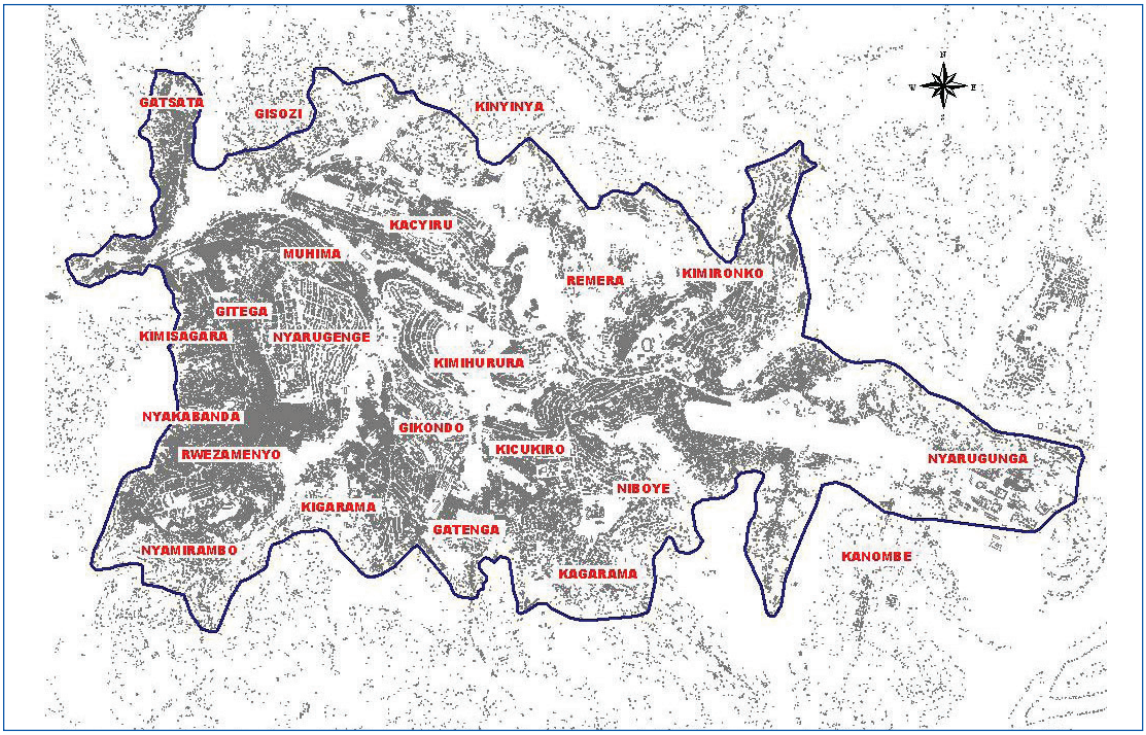


Figure 1: Location of fieldwork sectors

Gatsata is defined by the hill line to the west; the eastern edges are defined by a valley floor that straddles a river (Figure 2). Running parallel to the valley floor is another main road *towards Byumba*[1]. Both sides of the main road in Gatsata are occupied by commercial, light industrial, pubs, churches and other non-residential premises. The valley floor itself is reserved for agricultural production.

Figure 2: Overview of Gatsata layout

Topographically, Kimisagara is similar to Gatsata. The western edge of Kimisagara is denoted by the top of a range of hills and the eastern edge is defined by the avenue of Kigali Mount (Figure 3). This road separates Kimisagara from the valley floor immediately to its east. The area between the avenue and the valley floor is taken up by shops, small industries, restaurants, churches, government offices etc. The area to the west of the avenue is used almost exclusively for housing, the local school and Kimisagara water works.

1 Byumba is a former province located in the north of Rwanda

Figure 3: Overview of Kimisagara layout

Although Kimisagara has a larger population than Gatsata, the area is significantly smaller. The northern and southern bounds are separated by approximately 4.5 kilometres. Kimisagara and Gatsata are adjacent to each other and join at an intersection of main arterial roads (Figure 4). At this intersection, there is a market, business centre and a transport interchange. While Gatsata and Kimisagara are both sectors within the City of Kigali and share many social and economic characteristics, they fall within different administrative districts of Kigali. Gatsata falls within the Gasabo District and Kimisagara falls in the Nyarugenge District.

Figure 4: View of the intersection of Gatsata and Kimisagara and Nyabugogo Taxi Park

The National Institute of Statistics District baseline study of 2008 reveals basic features of Gasabo and Nyarugenge, the districts in which the two sectors are located. The baseline surveys show that the two areas have a combined population of just over 56 000 (Kimisagara; 32587, Gatsata: 23 615) (National Institute of Statistics for Rwanda, 2008a, National Institute of Statistics for Rwanda, 2008b). While the baseline study is silent as to personal and household income levels, the poverty of the areas can be inferred from the low service levels and other data (Table 1). The two areas are very similar in terms of the basic demographics and service levels. With the exception of the mode of waste disposal, few of the differences indicated by the baseline studies are statistically significant. For example in Kimisagara, 15 per cent of households are headed by women. In Gatsata, 18 per cent are headed by women. In Kimisagara 67 per cent of the male-headed households rent their dwellings. In that area only 55 per cent of the female household heads rent. In Gatsata, the respective proportions are 55 per cent and 48 per cent (National Institute of Statistics for Rwanda, 2008a, National Institute of Statistics for Rwanda, 2008b).

In both areas, ownership of the dwellings could have been acquired in several ways including inheritance and purchase. When the characteristics of the owned dwellings that are headed by males are examined, we have found that in Kimisagara, 62 per cent of the properties were purchased. In Gatsata, 51 per cent of such properties were purchased. The physical construction of households in these two areas is similar. In Kimisagara, 56 per cent of households have brick walls. In Gatsata, the comparable figure is 57 per cent. In Kimisagara, 93 per cent of households have sheet metal roofing while in Gatsata 91 per cent of households have such roofing (National Institute of Statistics for Rwanda, 2008a, National Institute of

Statistics for Rwanda, 2008b). There is somewhat greater variation in service levels. The comparisons are tabulated in the Table 1.

Table 1:Variation in service levels

Services	Kimisagara	Gatsata
Main water supply is piped water	98%	69%
Outside pit latrine	84%	71%
Indoor flush toilet	3%	4%
Outdoor flush toilet	2%	3%
Households with own latrine	89%	78%

Source: (National Institute of Statistics for Rwanda, 2008a, National Institute of Statistics for Rwanda, 2008b)

The above figures indicate that Kimisagara tends to have better service levels than Gatsata. However the asset levels in the two areas are very similar. In Kimisagara, 28 per cent of households own a television. In Gatsata, 30 per cent of households own a television. In Kimisagara, 3 per cent of households have a computer with internet access while in Gatsata; the comparable figure is 2 per cent. In both areas, 3 per cent of households have a car. Four per cent of Kimisagara households have a motor cycle. In Gatsata, only 2 per cent of households have a motor cycle. In Kimisagara, 57 per cent of male headed households have access to a bank account. In Gatsata a higher percentage of male headed households enjoy such access (67%). By contrast, only 47 per cent of female headed households in Kimisagara and 48 per cent of such households in Gatsata enjoy such access (National Institute of Statistics for Rwanda, 2008a, National Institute of Statistics for Rwanda, 2008b).

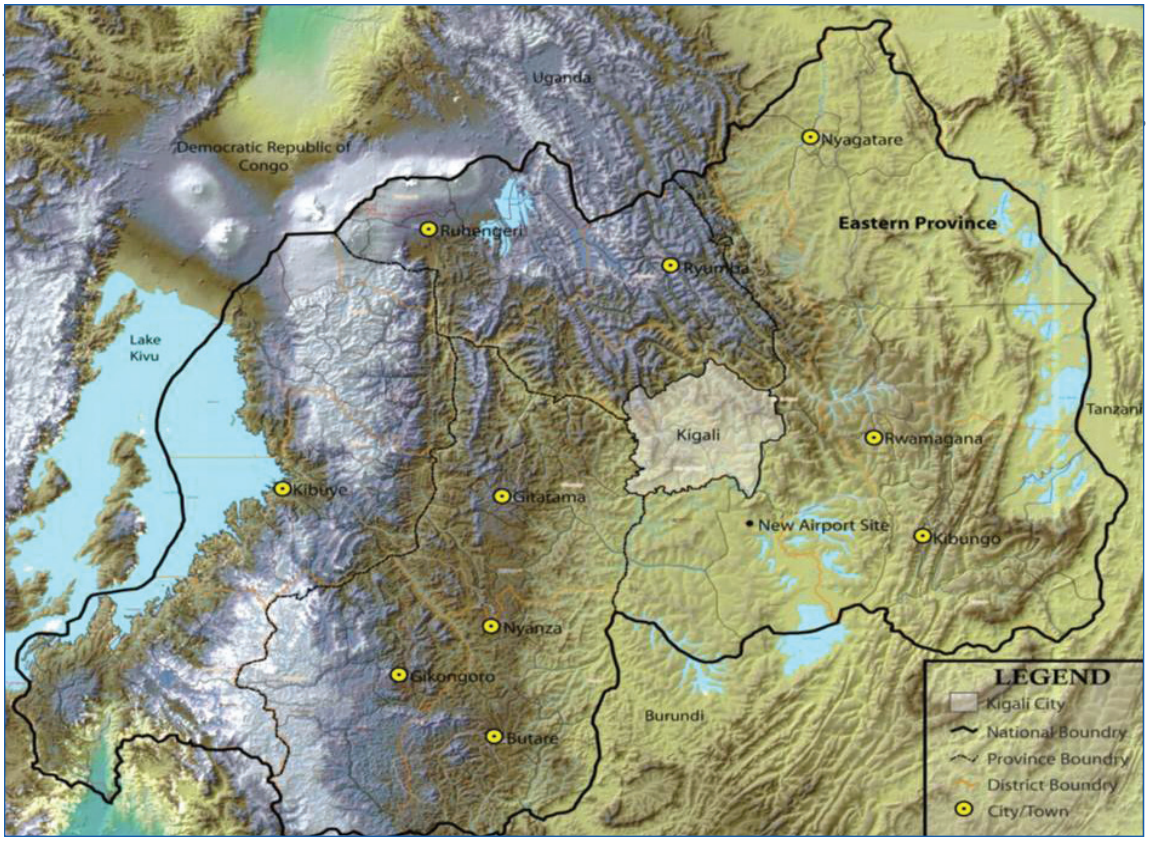


Figure 5: Location of Rwanda in relation to its neighbouring countries

As the figure 5 shows, Rwanda has no physical border with Kenya, one country which this project is working on. But, Kenya is not far from Rwanda especially, the City of Kisumu which one of the case-studies for this project (Figure 6).

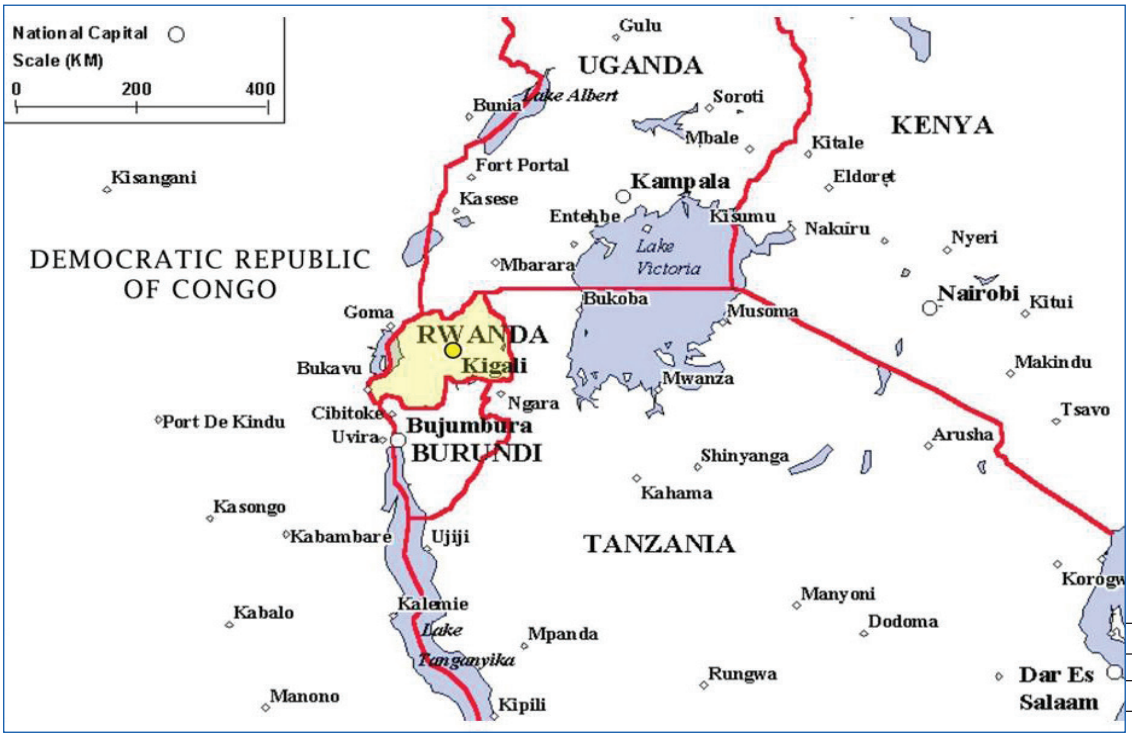


Figure 6: The location of Rwanda (Kigali) and its physical relationship to Uganda (Kampala) and Kenya (Kisumu)

2.2 Kigali description

Kigali which is a focus of this report is a commercial city and capital of the Republic of Rwanda. Rwanda has approximately one million inhabitants. The City of Kigali is built on hills sprawling across ridges and wet valleys in between (Figure 7), with varying soil, vegetation and hydrological characteristics. Due to urban expansion, these wetlands are under increasing pressure from land use by industrial, commercial and residential development thus damaging the balance of the ecosystem services and increasing the likelihood of flooding. The more affluent population tends to live on the higher ground while poorer people live close to or in the valley wetlands.

Figure 7: A satellite image of Kigali City showing its topography

Kigali's landscape reflects the topography of Rwanda in general, situated on rolling hilly terrain. It exhibits two types of relief; gentle relief with depressions where wetlands are typically located and the more high relief due to tight rectilinear ridges oriented north-south and northwest to southeast. Such topography creates significant challenges such as soil erosion, drainage and the construction of infrastructure on steep slopes. These challenges may necessitate careful consideration for new development, including considerations of access and removal of waste, as well as expense of infrastructure development and construction. Because of its high altitude, its temperature and rainfall are more moderate than the surrounding hot and humid equatorial regions, even though the climate follows the same annual cycles. Average temperature on the central plateau is about 19-20° C and changes about 0.5° C with every 100 meter change in altitude and the average annual rainfall is between 1000 and 1100 mm.

2.3 Characteristics of Rwandan population

Rwanda has one of the fastest growing populations in Africa. According to the most recent estimates (2010/11) the population is 10.8 million (National Institute of Statistics for Rwanda, 2012b) compared to 7.5 million in 1992 (United Nations 1995). The population declined between 1994/5 due to the Genocide and the exile of thousands of people in the neighbouring countries but grew rapidly from 1995 with the population growth rate peaking at 10 per cent by the late 1990s. The increase was due to a high fertility rate and returning refugees including those who had fled during earlier periods of unrest. The rate of population increase has decline since 2000 and been stable since 2005 at just under three per cent.

Population density is high across the country and has increased steadily and was 395 inhabitants per square kilometre in 2010 compared with 321 in 2002, 290 in 1992, 283 in 1991, and 191 in 1978. The population is essentially young, with 42.7 per cent of all Rwandans under the age of 15 (National Institute of Statistics for Rwanda, 2012b). The EICV (2010/11) figures show that women constitute the majority of the population (52.6%), while men make up 47.4 per cent (National Institute of Statistics for Rwanda, 2012b).

In Rwanda, there are a number of Christian dominations with the main one being Catholic. In the 1991 census, 90 per cent of the resident population identified themselves as Christian. This proportion has increased at the expense of those who profess no religion, who have declined from 6.8 per cent in 1991 to 3.6 per cent in 2002. The number of Muslim adherents has risen slightly, from 1.2 per cent of the

population in the 1991 census to 1.8 per cent in 2002 (National Institute of Statistics for Rwanda, 2012a). Nearly all Rwandans speak the same language, Kinyarwanda, which is the country's national language. French and English are official languages with English having become the main language of education and government. Kiswahili, the third most common foreign language, is generally spoken in urban areas especially in the City of Kigali.

2.4 Urbanisation in Rwanda

Urban development is a recent phenomenon starting at the beginning of the 20th century when the colonizers arrived in Rwanda. The absence of towns was partly due to scattered individual settlement across the whole country on the one hand and a decentralized economic system on the other. Before the colonial period, peddlers moved from one hill to another selling their goods (there was no established places for trade). The colonial administration did not encourage urban development in Rwanda because it was considered a country with very little economic interest. After independence, the governments opposed urban development and priority was given to the development of rural areas. However, since 2000, this situation changed and the government is now encouraging urbanization. However, rural-urban migration remains low with a higher proportion of the population living in rural areas in 2010/11 than in 2005/6 (National Institute of Statistics of Rwanda 2012).

At independence in 1962, Kigali's population was 6,000. Since then, the City of Kigali has experienced a high growth rate. According to EICV3 (2010/11), the urban population growth in Kigali has been exponential (National Institute of Statistics for Rwanda, 2012b) (Figure 8). This resulted in a concentration of the urban population in the capital estimated at 44 per cent of the total urban population in Rwanda. This situation confirms the phenomenon of urban monocephalism2 and highlights the imbalance between the City of Kigali and other urban centres. Secondary centres still remain unable to offer a solid base for employment and services to their population because of the insufficiency of public and private investments.

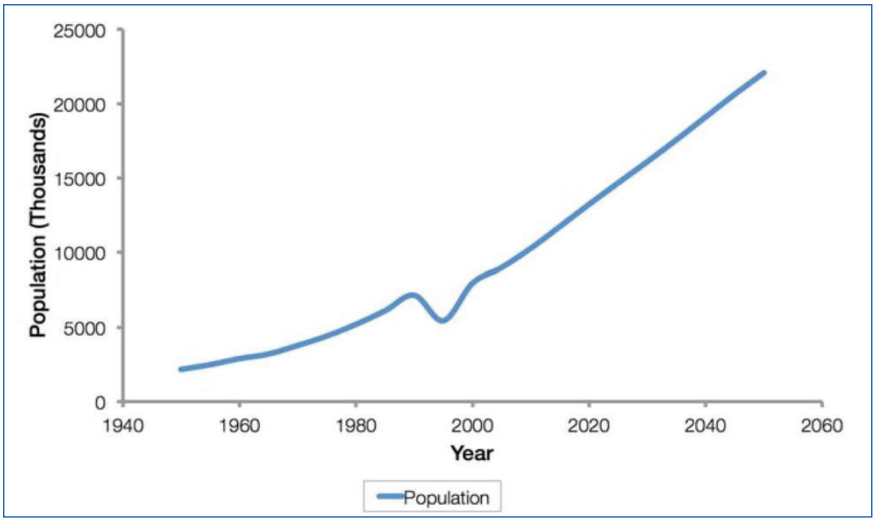


Figure 8: Population growth in Kigali City

This growth in the City of Kigali has occurred, however, without adequate physical planning. Within the context of this rapid and unplanned urban growth, the most pressing sanitation problems with significant implications on public health, especially for the urban poor are: (i) inadequate and unsafe drinking water; (ii) poor drainage and sanitation conditions; (iii) solid waste disposal hazards; and (iv) construction in inappropriate and hazardous areas due to unplanned urban development.

2 It is a phenomenon where in a country there is both demographic and economic imbalance between the Capital and other urban centres. With our case, urban population and economic activities are concentrated mainly in Kigali City, the capital of Rwanda

2.1 Urban poverty and employment rates

The results from the Third Integrated Household Living Conditions Survey (EICV3) (NISR 20102) show a reduction in poverty at the national level of 12 percentage points between 2005/06 and 2010/11(National Institute of Statistics for Rwanda, 2012b) from 57 per cent to 45 per cent . Poverty is estimated to be 44.9 per cent nationally, with 22.1 per cent of the poor living in urban areas and 48.7 per cent of the poor living in rural areas. Since 2005/06, the poverty headcount has fallen by some four percentage points in the City of Kigali and by 10 percentage points or more in the other Provinces, with the fall highest by far being in the Northern Province (National Institute of Statistics for Rwanda, 2012b). Poverty is highest in all three EICV surveys in the Southern Province and lowest by far in the City of Kigali (Figure 9). Kigali has by far the lowest poverty rate, 16.8 per cent in 2010/11 but has witnessed a much smaller decline in poverty over the period of just four percentage points.

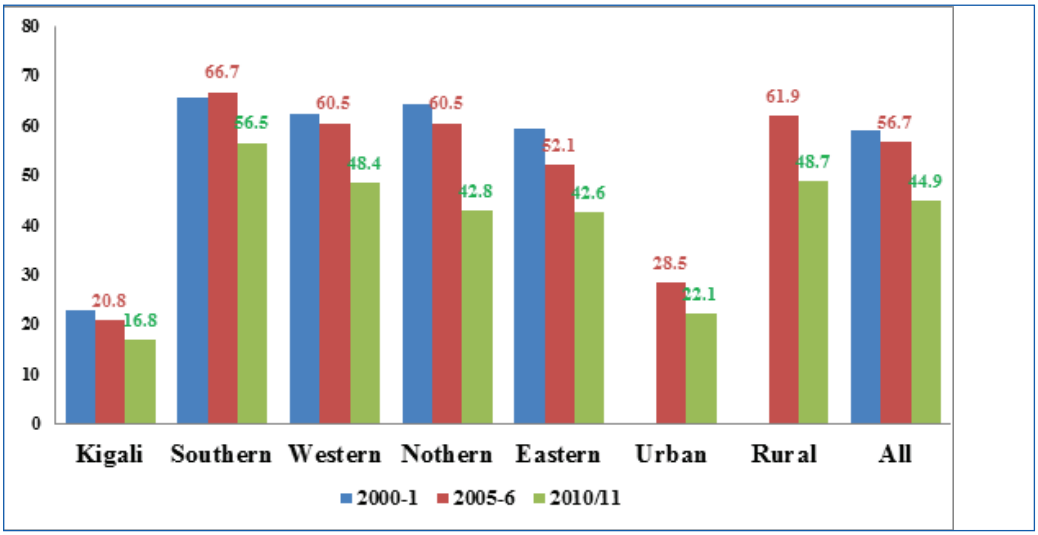


Figure 9: Poverty by province (2000/01, 2005/6, 2012/11) in percentages

Source: (National Institute of Statistics for Rwanda, 2012b)

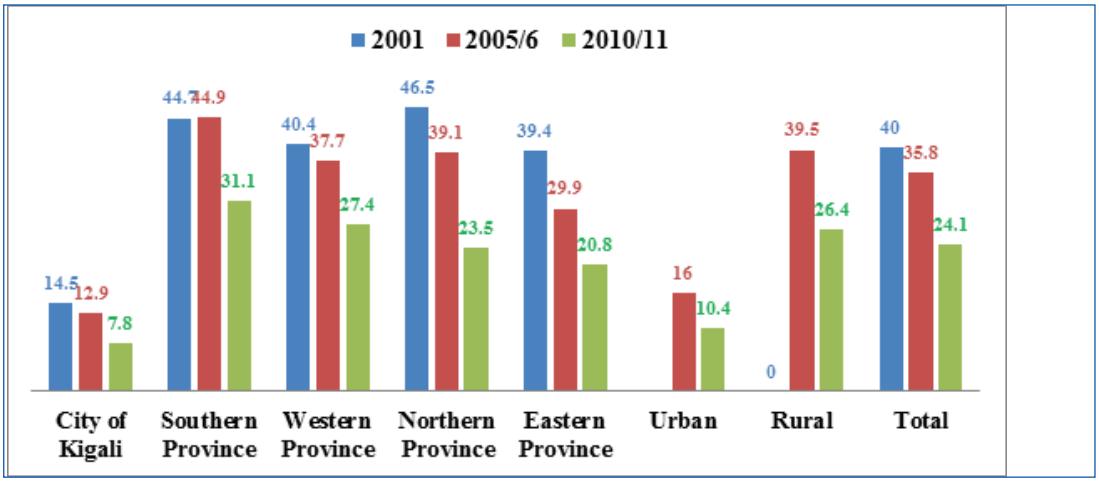


Figure 10: Extreme poverty in Rwanda 2000/1, 2005/6 and 2010/11 in percentages

Source: (National Institute of Statistics for Rwanda, 2012b)

Extreme poverty, fell from 40 per cent in 2000/01 to 36 per cent in 2005/06 to 24 per cent in 2010/11(National

Institute of Statistics for Rwanda, 2012b). This is again a substantial reduction over the recent five-year period following a modest fall in the first five-year period. The pattern of change by province is highlighted in figure 10. This shows large reductions in all provinces, all of which are statistically significant. Again, the greatest reduction is in the Northern Province. The Southern Province remains the area of the country with the highest levels of extreme poverty.

The urban poor are generally dependent on a monetized and informal economy unlike the vast majority of the rural poor who are dependent on subsistence agriculture. There is also a higher unemployment rate among poor people living in towns and they have poor living conditions in informal settlements (lack of basic socio-economic services such as water and sanitation, decent housing). However, 4.1 per cent of the population of Kigali are paid farm labourers and 19.1 per cent small scale farmers. Over 50 per cent of households (55.5%) grow crops and 34.5 per cent own livestock (National Institute of Statistics for Rwanda, 2012b).

Table 2: Population and economic activity rate changes

Survey	Employed	Unemployed	Student	Other inactive
EICV1	84.2%	0.8%	11.3%	3.6%
EICV2	84%	1.6%	10%	4.3%
EICV3	86.7%	1.4%	6.3%	5.5%

Source:(National Institute of Statistics for Rwanda, 2012b)

Official unemployment, it is very low as the vast majority of the adult population have to engage in income generating activities to survive. The officially unemployed are concentrated in the City of Kigali, tend to be female and live in households in the richer consumption quintiles (Abbott and Rwirahira, 2010). However, the percentage of the economically active population (employed and unemployed) has declined since 2000/01 (Table 2) due to an increase in those still in education with the proportion having nearly doubled over the last 10 years. The increase in jobs has largely kept pace with the growth in the economically active population due mainly to young adults staying in education longer (National Institute of Statistics for Rwanda, 2012b). However, there are significant amounts of hidden unemployment and underemployment and a growing recognition of the need to put more emphasis on job creation especially for those coming onto the labour market over the next 10 years.

In short, Rwanda has had a remarkable record in translating its recent growth into poverty reduction across the country over the past five years. There has been not only poverty reduction but pro-poor growth with the Gini coefficient falling from 0.52 in 2005/06 to 0.49 in 2010/11, lower than its level in 2000/01. However, it is important to highlight that inequality remains high in the City of Kigali. Table 3 summarises the evolution of inequality in Rwanda as measured by the Gini coefficient.

Table 3: Evolution of inequality in Rwanda

Gini coefficient	2000-1	2005-6	2010-2011
Kigali	0. 559	0. 586	0. 559
Southern	0. 425	0. 446	0. 373
Western	0. 445	0. 492	0. 395
Eastern	0. 403	0. 436	0. 362
Northern	0. 457	0. 431	0. 438
Rwanda	0.507	0. 522	0. 490

Source: (National Institute of Statistics for Rwanda, 2012b)

2.1 Economic growth and transformation

Rwanda's economy suffered heavily during the 1994 Genocide, with widespread loss of life and failure to maintain the infrastructure. This caused a large drop in GDP and destroyed the country's ability to attract private and external investment. From the late 1990s, there has been sustained economic growth with GDP per capita increasing from US$ 248 in 1999 to US$ 520 in 2009 (Abbott and Rwirahira, 2010, Abbott et al., 2010) and a compounded annual growth rate of 17 per cent between 2001 and 2010 (Napier, 2010, Abbott et al., 2010). Much of this growth has been driven by the rapidly growing private sector. Over 75 per cent of GDP comes from services and the agricultural sector. In 2010 the service sector accounted for the largest share of Rwanda's Gross Domestic Product (GDP) at 47 per cent, followed by the primary sector at 32 per cent, the secondary sector at 15 per cent with the reminding six per cent from Financial Intermediation Services, Indirectly Measured (FISIM) and taxes (National Institute of Statistics for Rwanda, 2012a). Agricultural production rose by five per cent from 2009, to 2010 and this rise was due to the increase in production of food crops (5%) and export crops (14%), which recovered from a decrease of 15 per cent in 2009.

In 2010, industry value added grew by eight per cent, while mining exports registered a decrease for the second consecutive year-11 per cent in 2010, compared with 18 per cent in 2009 (National Institute of Statistics for Rwanda, 2012a). Manufacturing increased by nine per cent; electricity, gas, and water increased by 15 per cent; and construction grew by nine per cent. At the same time, services value added increased by 10 per cent in 2010 as a result of nine per cent growth in transport, storage, and communication; 8 per cent growth in wholesale and retail trade; and 24 per cent growth in finance and insurance, after a recovery from a decrease of nine per cent in 2009 (National Institute of Statistics for Rwanda, 2012a). However, Rwanda remains one of the poorest countries in the world and is heavily aid-dependent; about 44 per cent of revenues in 2010/11 were from Official Development Aid with other aid coming from New Donors and international NGOs (National Institute of Statistics for Rwanda, 2012b). The ODPs who contribute to the Water and Sanitation Sector are Belgium, African Development Bank, the European Community and the World Bank.

3 LEGAL, REGULATION AND POLICY FRAMEWORKS FOR SANITATION

The Legal, Regulation and Policy frameworks for sanitation reviews and analyses the existing legal, regulation and policy system relevant to the 3K-SAN Project and identifies the processes that are intended to facilitate sanitation delivery, as well as those that hinder progress. Rwanda being a signatory to different international conventions and protocols, it is important to review some of the relevant international conventions, protocols and treaties.

3.1 International conventions and protocols

Rwanda is a signatory to a number of conventions and protocols which are directly or indirectly relevant to the 3K-SAN Project.

3.1.1 Ramsar Convention on Wetlands

The *Convention on Wetlands* is an intergovernmental agreement that offers the framework for national action and international cooperation for the conservation and wise use of wetlands and their resources (Rwanda Environment Management Authority, 2011). This convention requires Governments to avoid pollution in wetlands.

3.1.2 Convention on the Protection and Use of Transboundary Watercourses

The *Convention of the Protection and Use of Transboundary Watercourses* is intended to reinforce national actions for the protection and ecologically sound management of transboundary surface waters and groundwater. The treaty requests parties to prevent, control and diminish water pollution from point and non-point sources through the application of environmental impact assessment (Rwanda Environment Management Authority, 2011).

3.1.3 EAC Protocol on Environment

The protocol was contracted by the partner states of the "*East African Community*" on 29th November 2003. Article 5: Paragraph 4 states that countries should promote sustainable utilization of water resources and article 6, paragraph 1 puts emphasis on improving water quality and controlling pollution.

3.2 General Framework

3.2.1 Millennium Development Goals

A recent evaluation of Rwanda's progress towards achieving the MDGs showed that progress was being made although not all targets will be met by 2015 (Abbott and Rwirahira, 2012). The MDGs include a target directly referring to Water and Sanitation services. Target 7C is to *halve by 2015 the proportion of people without sustainable access to safe drinking water and basic sanitation* (World Bank, 2008). Box 1 highlights MDG 7 and its targets. In 2010/11, the proportion of population in the City of Kigali using an improved drinking water source was 84.8 per cent and the proportion of population using an improved sanitation facility was 83.3 per cent (National Institute of Statistics for Rwanda, 2012b). However, the 2012 MDG update report has argued that Rwanda is off track to achieve MDG Target 7(Abbott and Rwirahira, 2012)

Box 1. Millennium Development Goals

Goal:

- **Ensure Environmental Sustainability**

Targets:

- **Integrate the principles of Sustainable Development into country policies and programmes; reverse loss of environmental resources;**
- **Reduce between 1990 and 2015 by half the proportion of the population without sustainable access to safe drinking water;**
- **Reduce between 1990 and 2015 by half the proportion of the population without access to improved sanitation**
- **Achieve significant improvement in the lives of at least 100 million slum dwellers by 2020.**

Source: (Rwanda Environment Management Authority, 2010)

3.2.2 Rwanda Vision 2020 (2002-2020)

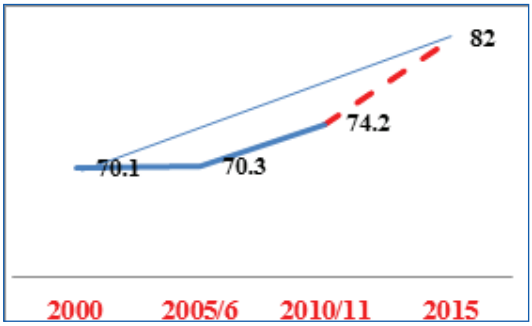
Rwanda's Vision is to build a knowledge-based economy and to become a private sector led middle income country by 2020 (Abbott and Rwirahira, 2010). It is the long term development framework that sets out Rwanda's development agenda. It targets to increase per capita Gross Domestic Product (GDP) from approximately US $ 250 in 2000 to at least US $ 900 by 2020. In February 2012, the Government retreat revised this to $1,240. Environment is a cross-cutting issue in Vision 2020 along with HIV/AIDS, gender, youth and social inclusion (including the inclusion of people living with disabilities). This means that all policies and programmes are expected to take them into consideration. With regards to the Water and Sanitation sector, the Vision 2020 states that all Rwandans will have access to safe drinking water in 2020 (Ministry of Finance and Economic Planning, 2002b). Some relevant paragraphs of "*Vision 2020*" are: "*Waste Management: At least 80% of the Rwandan population will have easy access to adequate waste management systems and will have mastered individual and community hygiene practices".*

Also, this vision states that by 2020, *"the rural and urban areas will have sufficient sewerage and disposal systems; each town will be endowed with an adequate unit for treating and compressing solid wastes for disposal*". Households will have mastered and be practicing measures of hygiene and waste disposal". To achieve the Sanitation targets by 2020, the urban as well as rural areas are expected to mobilize sufficient investment for sewerage and disposal systems, in addition to which, each town will have adequate facilities for treating and compressing solid wastes for disposal. Although there there has been an increase in the proportion of households with access to sanitation, the *Vision 2020, 2010* target of 80 per cent was not met (Ministry of Finance and Economic Planning, 2002b).

3.2.3 The Economic Development and Poverty Reduction Strategy (2008-2012)

EDPRS is Rwanda's Medium Term Framework for achieving its long term development aspirations (Ministry of Finance and Economic Planning, 2007). It is the second comprehensive national plan designed to implement Vision 2020. It incorporates the Millennium Development Goals. In contrast with the PRSP 1 (2002-2005) where national poverty reduction priorities focused on improving social indicators (access to education, health, water and sanitation), the context of this strategic plan focuses on economic development economic growth and transformation with private sector growth and the commercialisation of farming given higher priority (Ministry of Finance and Economic Planning, 2007). Much more pertinent

to this strategic plan, the EDPRS has included the environment as one of the critical cross-cutting issues along with HIV/AIDS, youth, people with disabilities, social inclusion and gender. EDPRS includes strategies and priorities for improving the living conditions of the poor, improving the infrastructure and governance.



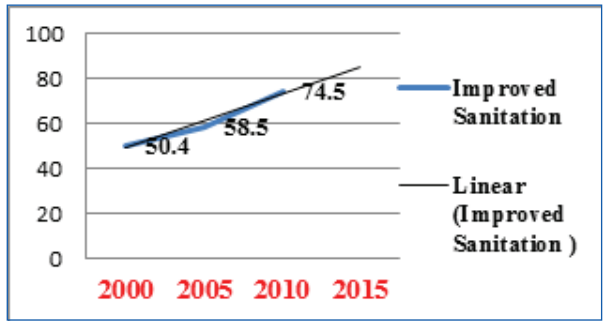


Figure 11:Access to safe drinking water and improved sanitation (2000-2010/11) and linear progression
Source: (National Institute of Statistics for Rwanda, 2012b)

EDPRS specifies the priorities to be achieved during the five-year period 2008-2012. During the EDPRS period, the Water and Sanitation sector aimed *to increase the proportion of the population accessing safe water from 64 per cent to 86 per cent, and the proportion with sanitation services from 38% to 65%. It is also planned to increase the proportion of the rural population living within 500m of an improved water source from 64 per cent to 85 per cent, and to raise the proportion of the urban population residing within 200m of an improved water source from 69 per cent to 100 per cent. As regards to Sanitation, the sector plans that the proportion of schools with latrines complying with health norms will rise from 10 per cent to 80 per cent, and that the corresponding proportion for rural households will increase from 38 per cent to 65 per cent (Ministry of Finance and Economic Planning, 2007).*

There has been an increase in improved sanitation, with 74.5 per cent of households having an improved facility by 2010/11, up from 50.4 per cent in 2000 (Figure 11). Given that the total safe drinking water and improved sanitation are respectively 74.2 and 74.5 per cent in 2010/11, it is clear that *EDPRS* 2012/13 target of 86 per cent of households having such access will not be met and for water the MDG 2015 target is unlikely to be met. It should be noted that EDPRS aimed to allocate 4.2 per cent of the budget to the Water and Sanitation Sector but it only allocated 3.72 per cent in 2008, 0.36 per cent in 2009 and 1.94 per cent in 2010/1.

3.3 Policy Framework relevant to sanitation

Besides *National Decentralization Policy, Water and Sanitation Sector Policy, Environmental Health Policy, National Urban Housing Policy, Health Sector Policy and Land Policy, the National Gender Policy, the Girls Education Policy and Strategic Plan, Health Sector Policy* which complement an *Environmental Policy*, provision of Water and Sanitation are very much emphasised in other major country's policies and documents such as *National Human Settlement Policy, National Water Resources Management, National Wetlands Conservation Program and National Investment Strategy Document* and child friendly schools infrastructure standards and guidelines (Tsinda A, 2011).

3.3.1 The National Decentralisation Policy

The National Decentralisation Policy enables citizens to take part in making decisions about priorities for government and contributing to the planning process and to stand for election for committees at a local level (Ministry of Local Government, 2007).

3.3.2 Environmental Policy

This policy involves improvement of the population's wellbeing, the judicious utilization of natural resources and the protection and rational management of ecosystems for a sustainable and fair development. This is achieved through improved health and quality of life for every citizen and promotion of sustainable

socio-economic development through a rational management and utilization of resources and environment, integrating environmental aspects into all the development policies, planning and in all activities carried out at the national, provincial and local level, with the full participation of the population in the activities for the improvement of environment with special attention to women and the youth; adoption of environmentally friendly technologies, role of private sector and civil society in coordinated and harmonious actions which favour the environment.

3.3.3 National Water and Sanitation Sector Policy

The *National Water and Sanitation Policy* is a very important document which guides Water and Sanitation provision in the country. It is based on *Vision 2020*, *Millennium Development Goals* and *Poverty Reduction Strategy* (Ministry of Infrastructure, 2010). The Policy provides for Decentralization in line with the *National Decentralization Policy*, institutional aspects, integrated watershed management, monitoring and assessment and participatory approach to Water and Sanitation (Ministry of Infrastructure, 2010). The Policy proposes measures to achieve policy objectives of improving the living conditions of the population through optimal use of water resources and access of all to water and sanitation services. For instance, marshlands are a source of domestic water and development of these areas could have a bearing in water and sanitation of the communities. The Policy is oriented to achieving the *Vision 2020, MDGs* and other national and international policies and agreements such as *National Investment Strategy, Agenda 21*.

The National Water and Sanitation Policy focuses on six sanitation related fronts: *household sanitation, institutional sanitation, collective sanitation, storm water drainage, solid waste management, and institutional sector framework*. This Policy draws greater focus to urban sanitation, defining a policy framework that supports the *Sanitation Master Plan for Kigali city*. This policy is formulated by giving priority to basic services, decentralisation, community participation, cost recovery and financial sustainability, private sector participation, operational efficiency and strengthening of accountability, emphasis on sanitation and hygiene, interests of women and children, grouped settlements, environment and water resources protection and inclusive programme approach.

It stresses on the importance for urban areas to have sanitation master plans which will identify zones for on-site sanitation and collective, off-site sewerage; focus on simplified, affordable solutions for collective sanitation; outline solutions for septic tank emptying services and sludge disposal; identify critical polluters such as industries, hospitals and slaughterhouses, and suggest solutions for treatment and identify type and locations of sludge disposal facilities and, if applicable, of treatment plants. The 3K-SAN Project is coherent with this policy as the project aims directly at improving sanitation in informal settlements and indirectly at poverty reduction and economic development through public health promotion.

3.3.4 Health Sector Policy

One of the objectives of Rwanda *Health Sector Policy* is to improve the quality of and demand for services in the control of disease through hygiene promotion (Ministry of Health, 2005). The Policy identifies the most common illnesses in Rwanda - most are hygiene related - and puts priority on addressing these diseases. This fits with the 3K-SAN project in improving hygiene and sanitation at the household level. The Policy calls for the strengthening of measures to prevent and improve the management of diseases (Ministry of Health, 2005).

This policy involves the diagnosis and treatment of cases; increase in the protection of individuals and communities using preventative methods like management of the environment, including vector control; marshlands having a role to play in malaria incidences and therefore the policy emphasises more on environmental control of the disease vector especially in marshy areas as opposed to curative services. It is also important to mention that there is a Health Sector Strategic Plan II (HSSP II) which promotes healthier lifestyles and prevention of diseases. This is coherent with 3K-SAN/SPLASH project since it seeks a cost effective strategy, not only to meet the sanitation MDG, but also to decrease the burden of disease and alleviate poverty throughout the three countries (Rwanda, Uganda and Kenya).

3.3.5 Environmental Health Policy

The Environmental Health Policy formalised the shift in the government's strategy to improve health indicators from curative to preventive approaches (Ministry of Health, 2008). The Health Sector Strategic Plan 2009-2012 further supports this by identifying sanitation as a high impact intervention that the government will scale up (Ministry of Health, 2008). This fits with 3K-SAN/SPLASH project in the sense that it aims at catalysing self-sustaining chains in informal settlements where sanitation is an issue.

3.3.6 National Water Resources Management Policy

The *National Water Resources Management Policy* aims at fair and sustainable access to water, improvement of the management of water resources through reforestation on hillsides and water catchments areas (Rwanda Environment Management Authority, 2011). This Policy is relevant to 3K-SAN/SPLASH project as most of the project activities will be undertaken in informal settlements with unimproved sanitation and some of them are located near the swamps.

3.3.7 Land Policy

This policy provides a framework for the use and management of uplands and marshlands, the rational use and sound management of national land resources which is to be based on master plans and land use plans based on the suitability of the land for different purposes. Marshlands are subject to special protection and to be used only after adequate planning and environmental impact assessment has taken place. The policy also sets out the process for land tenure regulation whereby those with customary rights to land will be given a legal registration certificate (Ministry of Natural Resources, 2004a).

3.3.8 National Human Settlement Policy

This policy aims at improving the settlement conditions of the urban population (Ministry of Infrastructure, 2004b). It seems to be completely silent on sanitation issues in the sense that the policy does not guide land use for sanitation or solid waste management in urban areas.

3.3.9 National Urban Housing Policy

This Policy recognizes the need to ensure that people have access to potable water and adequate sanitation facilities. The process of upgrading and provision of services for urban areas will be carried out upon taking into account the income levels of households as well as infrastructure and services to be established (Ministry of Infrastructure, 2008). According to this policy, the upgrading is not synonymous with razing an entire neighbourhood; instead, it means rational redevelopment in order to improve the living conditions of the population. The intervention of 3K-SAN /SPLASH Project fits with the policy as it analyses all characteristics of informality including poor housing.

3.3.10 The National Gender Policy

The *National Gender Policy* provides a framework for the promotion of gender equality and the empowerment of women and shows the Government's commitment to addressing all forms of gender inequality in the country (Abbott and Rucogoza, 2011). The National Gender Policy clearly sets out the process of mainstreaming gender in all public and private sectors, policies, programmes, projects and so on. It also concerned with the empowerment of women. The Ministry of Gender and Family Promotion coordinates the implementation of the policy (Ministry of Gender and Family Promotion, 2010). The Policy sets out the key objectives for ensuring the economic empowerment of women: for employment and growth; for health; in education and vocational training; in governance and justice; in environment protection and land use management; of the most vulnerable; for participating in the private sector; in water and sanitation; in infrastructure; in transport; and, in ICT. All of these are in line with the *EDPRS* priorities (Ministry of Gender and Family Promotion, 2010).

3.3.11 The Girls Education Policy and Strategic Plan

The Girls' Education Policy and a Strategic Plan were approved in 2008. They are aimed at achieving gender equality in education at all levels. The Policy will be implemented through Girls Education Strategic Plans at District, school and institutional levels (Abbott and Rucogoza, 2011). The overall objective of

the Policy is to guide and promote action aimed at the progressive elimination of gender inequalities in education and training at all levels (Ministry of Education, 2008). As part of the implementation of the policy, separate toilets for girls and boys are being provided in all primary schools. This is very relevant to 3K-SAN/SPLASH as this implementation reduces the drop-out of girls from education.

3.4 Programmes relevant to sanitation

3.4.1 Child Friendly Schools Infrastructure Standards and Guidelines

The *Child friendly schools infrastructure standards and guidelines 2009* for Primary and *Tronc Commun* schools offers practical guidance on how to achieve the standards set in the *Rwandan Education Quality Standards 2008* (Ministry of Education, 2009). Through this document, the Ministry of Education of Rwanda sets clear levels of acceptability as a standard and gives practical guidance on how to achieve them. There are four standards of Child Friendly Schools Infrastructure: "*a school must have appropriate, sufficient and secure buildings*", "*a school must be a healthy, clean, secure and learner protecting environment", "a school must have a child-friendly, barrier free environment which promotes inclusive access and equal rights of every child*", "*a school must have adequate and appropriate equipment that support the level of education*" (Ministry of Education, 2009). This document is relevant to 3K-SAN Project as appropriate toilets standards are conducive to improved sanitation in schools.

3.4.2 National Wetlands Conservation Program

This program engages various government ministries in wetland conservation and ensures a holistic approach to wetland management (Rwanda Environment Management Authority, 2011). All authorities concerned will have proper coordination of activities concerning wetland management.

3.4.3 National Investment Strategy

The *National Investment Strategy* is a document which encourages the private sector to participate in the provision water and sanitation systems in urban and rural areas at affordable prices for the citizen (Ministry of Finance and Economic Planning, 2002a). It states that the state will continue to play a leading role in the development of water and sanitation sector through the provision of the necessary infrastructure. According to this strategy, urban development must consequently be well planned in a progressive and participatory manner according to the capacities of various players in the sector. This is in line with the 3K-SAN project since the project gives emphasis on private sector in the sanitation promotion.

3.4.4 National Land Tenure Reform Programme

The National Land Tenure Reform Program is a country-led strategic program (Ministry of Natural Resources, 2007) in which the Government of Rwanda is engaged with national and international partners to ensure the implementation of the *National Land Policy* and the *Organic Land Law* in a transparent and efficient way. Land reform involves changes in land tenure that abolish complex dual system of statutory and traditional/customary rights with the intention to introduce more simple and streamlined mechanisms of land related transactions or transfers.

It is in this context that land titling and land registration have started. Land titling and land registration do not form a separate entity but are interlinked as they all aimed at ensuring security of tenure through recognition of land rights to the land owners. As stated by Experts from UN-Habitat, when land titling is the process of emphasizing the evidence of a person's rights to land, land registration is the process of recording those rights (Rurangwa, 2007) . The benefits of land registration and titling and adjudication being the cornerstone of the whole process, as stated by the literature , include among others certainty of ownership, reduction in land disputes, stimulation of the land market, security for credit, facilitation of land reform, facilitation of land management, improvements in physical planning (Rurangwa, 2007). However, the process will have no impact on the residents of informal settlements as they do not have customary rights to the land on which their houses are built.

3.5 Legal and Regulatory Framework

The main elements of the legal and regulatory framework are the new Rwandan Constitution of 2003 (Official Gazette of the Republic of Rwanda, 2003), the Organic Law Determining the Modalities of Protection, Conservation and Promotion of Environment of April 2005, and different ministerial orders and acts. These underscore the right of the citizen to a healthy environment. They also underline the obligations of the state and of individual citizens to protect the environment. In addition, the organic law for environmental protection has preventive and punitive provisions for those who pollute or damage the Environment.

3.5.1 The Rwandan Constitution

The *Constitution of the Republic of Rwanda* was introduced in 2003 following approval by a referendum held on the 24th May 2003. The Constitution incorporates the articles of environment protection. For instance, article 4 states that each citizen has the right to healthy and satisfying environment; each person has the right to protect to conserve and promote the environment; the government will take care of the environment protection. An Act defines the procedures of protecting, conserving and promoting the environment. The right to sanitation within the constitution is indirectly recognised but it is not clearly stated.

3.5.2 Organic Law No 04/2005 of 08/04/2005 on Environment Protection and Management

The Organic *Law No 04/2005 of 08/04/2005 on Environment Protection and Management* was adopted in 2005. It provides a strong legal framework for environmental protection. For instance, Chapter IV of the Organic Law article 3 states that every person has the duty to protect and promote the environment; article 60 states that REMA in collaboration with decentralised entities are responsible for the implementation of laws, policies, strategies, objectives and programmes relating to protection, conservation and promotion of the environment in Rwanda; article 62 stipules that decentralised entities have also responsibility of designing plans of collecting and treatment of domestic waste, collecting and piling domestic waste. They shall also put much emphasis on the removal of any other waste in any possible way depending on its nature and quantity, supervision and its treatment.; article 65 further specifies that every project shall be subjected to environmental impact assessment prior to its commencement; the organic law also puts in place the National Fund of the Environment in Rwanda (FONERWA); the article 66 specifies that it has created, to the level of the Provinces, of the City of Kigali, of the Districts, the Cities, the Sectors and the Cells, Committees responsible for the conservation and the protection of the environment (Official Gazette of the Republic of Rwanda, 2005b).

On initial inspection Kigali is now a clean city but while the cleanliness of roads, hotels, restaurants and some residential areas has been much improved this is not the case for informal settlements. If you travel around the City of Kigali, especially to the informal settlements, you will see that the laws on environmental protection and public health are not always enforced. *Rwanda State of Environment Report* states that Kigali is sinking under the weight of its rubbish and sewerage (Rwanda Environment Management Authority, 2010). This situation may be explained by several factors. The main point here is that the Rwanda Environment Management Authority and decentralised entities (City of Kigali, Districts and Sectors) which are responsible for laws enforcement do not have sufficient qualified staff to deal with technical issues. Another factor is that, REMA has not yet published clear standards and guidelines for discharging wastewater in the environment; they do not have legal instruments for law enforcement. In addition, through the *Organic Law on Environmental Protection, Conservation and Management*, Rwanda Environment Management Authority is mandated to establish modalities and regulations for the collection and use of the environment-protection fees.

Table 4: Sanctions for Solid and Wastewater Management according to the Organic Law on Environmental Protection

Type of violations	Measures of monetary sanctions
Anyone who undertakes illegal research or commercial activities of valuable minerals	A fine ranging from one million (1,000,000) to two million and five hundred thousand (2,500,000) Rwandan francs and an imprisonment ranging from six (6) months to two (2) years or one of these penalties
Anyone who dumps in unaccepted manner or without authorisation any waste that is subject to prior authorisation provided for by this organic law	A fine ranging from one million Rwandan francs (1,000,000) to five million (5,000,000) Rwandan francs and an imprisonment ranging from six (6) months to two (2) years or one of these two penalties
Anyone who pollutes inland water masses by dumping, spilling or depositing chemicals of any nature that may cause or increase water pollution	A fine ranging from two million (2,000,000) to five million (5,000,000) Rwandan francs and an imprisonment ranging from two (2) months to two (2) years or one of these penalties
Any treatment plant which is authorised to treat waste products but which dumps it in inappropriate place	A fine ranging from one million (1,000,000) to ten million (10,000,000) Rwandan francs
Any person who deposits, abandons or dumps waste, materials, or who pours sewage in a public or private place	A fine ranging from ten thousand (10,000) to one hundred thousand (100,000) Rwandan Francs except if such a place has been designated by competent authorities

Source: (Official Gazette of the Republic of Rwanda, 2005b)

The problem with measures of monetary sanctions is that Rwanda Environment Management Authority is not in position to establish modalities and regulations on the sanction since it has no expertise in the financial domain. As a consequence, the law shows its weakness in establishing regulations on fines for general violations that seem even to be unclear as legal texts. There is not, as yet, adequate information on how these fines are being applied, nor the circumstances under which forcible compensation or forcible cessation of violations are being imposed. This document is silent on what technology for sanitation is appropriate.

With regard to crimes, article 74 states that without prejudice to other provisions, REMA may investigate and prosecute crimes provided for by this organic law and other related laws. In the article 81, the following are prohibited: dumping or disposal of any solid, liquid waste or hazardous gaseous substances in a stream, river and in their surroundings; damaging the surface or underground water; defecating or urinating in inappropriate place; spitting, discarding mucus and other human waste in any place. With article 83, it is prohibited to dump in wetlands: waste water, except after treatment in accordance with instructions that govern it; any hazardous waste before its treatment, any activity that may damage the quality of water is prohibited. Article 87 states that it is prohibited to construct houses in wetlands (rivers, lakes, big or small swamps), in urban or rural areas, to build a sewage plant and any other buildings that may damage such a place in various ways. All buildings shall be constructed in a distance of at least twenty (20) metres away from the bank of the swamp.

3.5.3 Law N° 16/2006 of 03/04/2006 determining the organisation, functioning and responsibilities of REMA

This law determines the responsibilities, powers, organisation and the functioning of the national authority to manage environment (Official Gazette of the Republic of Rwanda, 2005a).

3.5.4 Environmental Impact Assessment Regulations

Ministerial Order N°004/2008 of 15/08/2008 establishes the list of works, activities and projects that have to be done to undertake an environmental impact assessment highlights some projects as follows; construction and repair of international and national roads, plants, large bridges, industries, factories, hydro-dams and electrical lines, public dams for water conservation, large hotels public building which accommodate more than one hundred daily, extraction of mines and public land fills among others (Official Gazette of the Republic of Rwanda, 2008c).

3.5.5 By laws N° 01/11 of 23/10/2011 of the City of Kigali concerning hygiene and sanitation

Upon the advice of the committees responsible for the protection of environment referred to in article 66 of organic law, consultative committees of Districts, Towns and City, pass by-laws concerning hygiene and sanitation. These new rules are the revised version of the current by-laws which were passed in 2006 and will guide residents in maintaining the city's cleanliness. These rules were revised because the by-laws that guide the City of Kigali were made in 2006 when the city was smaller than it is today. With the increase in population and development of new buildings, industries, estates, it became necessary to modify some of the laws to make them applicable in today's situation. The modified laws are mainly concerned with the way garbage and human waste are disposed, and the standard hygiene expected. In the new by-laws, garbage that does not decompose, like plastics, should be separated from garbage that decomposes before disposal. Families should also have the necessary garbage tools.

Waste from industries should be treated at the factory, or the owners seek special permission from relevant authorities (Kigali City Council, 2011). This will prevent potential danger that can be imposed by the emerging industries. Commercial buildings would be differentiated from residential buildings that are used for business. This implies that a certain number of sanitary places should be available at the residential house used for business, which was not the case before. Residential estates and storied buildings will be forced to install a waste treatment plant in the new era. The standard cleanliness expected of public places like restaurants, food stores like butcheries, roads, homes is also highlighted in the new set of by-laws. Punishments for people who will break the rules are also clarified. These rules aim at promoting the health of the residents and promote their living standards.

3.5.6 Law N°57/2008 of 10/09/2008 relating to the prohibition of manufacturing, importation, use and sale of polythene bags in Rwanda

According to this law, any unauthorized person who sells polythene bags shall be punished by a fine ranging from ten thousand Rwandan Francs (18$US) to three hundred thousand Rwandan Francs (500$US); any unauthorized person who uses polythene bags shall be punished by a fine ranging from five thousand Rwandan Francs (9$US) to one hundred thousand Rwandan Francs (180$US) and his/her bags shall be confiscated; all persons mentioned above shall be dispossessed of their polythene bags and the bags shall be taken to the appropriate stores established by Rwanda Environment Management Authority (Official Gazette of the Republic of Rwanda, 2008a).

3.5.7 The Organic Law related to the Land Policy in Rwanda N°08/2005 of 14/07/2005

Since the colonial period until the recent adoption of the National land Policy and the enactment of the Organic Law No 08/2005 of 14/07/2005 determining the Use and Management of Land in Rwanda, the land tenure system in Rwanda was characterized by a dual system of land tenure: the written/statutory tenure system and the customary/unwritten tenure system (Rurangwa, 2007). Apart from a minority of urban dwellers and commercial farms dwellers, more than 90 per cent of land fell under the customary or unwritten land tenure arrangements. It is important to note that although the majority of land proprietors own land under a customary or unwritten land tenure system this was an individualized land tenure system as opposed to a community or communal land tenure system found elsewhere in Africa where access to land is controlled by hierarchy of traditional leaders. The written land tenure arrangement gives

effect to different land rights held under various types of legally valid documents3.

It is important to highlight here that this law sets out the role of the state, the rights and duties of land owners, the categories of land and the institutions for land management. It also determines the terms of use and management, fixes the principles to be applied to the recognized rights on the whole lands located along the national territory (Official Gazette of the Republic of Rwanda, 2005b); article 3 states that the land is included within the common inheritance of all the Rwandan people; the ancestors, the present and future generations. However, apart from the small amount of land owned by individuals in urban areas (mainly Kigali), all land, as under customary tenure, under the Land Law belongs to the state. Those with customary tenure rights are required to register their land and then they are given 99 year leases and have to pay land tax to the state. All wet lands belong to and are under the direct control of the state. Securing property rights is recognized as an important aspect of economic reconstruction because title to land improved people's ability to borrow money and creates incentives to invest their own money in better basic assets including sanitation. However, those living in informal settlements are unlikely to benefit from the law as they do not have customary rights over the land their homes are built on.

3.5.8 Ministerial order N°002/2008 of 01/4/2008 determining modalities of land registration

This order defines the modalities for land registration, including the establishment of a Register of Land Titles, procedures for the registration of titles to land and other interests in land, transfers of title to land and other transactions related to land, and related matters (Official Gazette of the Republic of Rwanda, 2008b). All land will be registered by the end of 2013 and all owners will have legal titles. A key element is that legally married wives and the children of legally married couples are named on the registration certificate as having an interest in the land and the wife as the co-owner.

3 It should be noted that the vast majority of land in Rwanda has always been and is owned by the State. Ownership of land is leasehold with owners of larger land holdings having to pay land tax to the state

4 INSTITUTIONAL MANAGEMENT IN URBAN SANITATION IN RWANDA

Prior to analysing institutional management in urban sanitation in Rwanda, it is important to describe the structure of government at the national and local levels. The current constitution divides Rwanda into Provinces (*intara*) and the City of Kigali, Districts (*uturere*), Sectors (*imirenge*), and Cells (*utugari*), Villages (imidugudu) with each subdivision and its borders established by Parliament (Official Gazette of the Republic of Rwanda, 2003).The four Provinces and the City of Kigali act as intermediaries between the national government and their constituent Districts to ensure that national policies are implemented at the District level and increasingly being devolved to sectors.

The *Rwanda Decentralization Strategic Framework* developed by the Ministry of Local Government clearly assigns to Provinces and the Kigali City the responsibility for *coordinating governance issues in the Province, as well as monitoring and evaluation* (Ministry of Local Government, 2007). While each Province is headed by a Governor, appointed by the President and approved by the Senate, the Kigali City is headed by the Mayor who is elected for five years. The Districts are divided into Sectors, which are responsible for the delivery of public services (Ministry of Local Government, 2007). Districts and Sectors have directly elected councils, and are run by an executive committee selected by that council. The Cells and Villages are the smallest political unit, providing a link between the people and the sectors (Ministry of Local Government, 2007). This structure helps in the planning process as most of participatory initiatives are done at the village level. Details about participatory initiatives (e.g. umuganda or community work, imihigo or performance contracts) will be discussed later in section concerning local initiatives (Section 9).

Turning now to the institutional management, the Rwanda institutional sanitation framework is being developed. The sanitation sector is characterized by significant structural changes and reforms, either accomplished in recent years or still on-going. In Rwanda, the sanitation sector involves several stakeholders, including government state institutions[4], NGOs, civil society, the private sector, decentralised entities and donors. Responsibilities of each stakeholder for sanitation are presented in Table 5.

Table 5: Division of stakeholders' responsibilities with regard to sanitation in Rwanda

Stakeholders	Responsibilities
Ministry of Infrastructure	Implementation of investment and labour intensive water and sanitation projects, funding sanitation projects, prepares and monitors and regulates water quality and hygiene standards, setting policies related to sanitation, water supply, infrastructure, urbanization and settlements, supports districts in the construction of water supply systems, latrines and hygiene promotion
Ministry of Health	Control and monitor activities of all the hospitals, health services in respecting regulations on hospital and hazards waste management and promote sanitation, healthy standards and regulations for water and sanitation, funding the construction of latrines within the hospital, overseeing the implementation of Environmental health related programmes that mitigate water borne diseases, promoting of hygiene among the population; developing policies, strategies and guidelines for sanitation as well as medical waste disposal and treatment, takes the lead in household sanitation and hygiene promotion
Ministry of Natural Resources	Define the overall policy of water and sanitation, mobilise funds for the sanitation sector, provides support to districts in the sector, organises activities of land as well as of WSS, planning of Water and Sanitation projects, funding of water and sanitation projects, using governments funds, but also bilateral and multilateral donors funds

4 With the new updated policy document on water and sanitation services, the separation between WSS services (under the Ministry of Infrastructure) from water resources management (under the Ministry of Natural Resources) seems to be a bit clear but still, the confusion exists in terms of implementation

Ministry of Local Government	Ensure good governance in all local administration levels including environment governance at local level, playing an intermediary role in channelling funds for development projects, over-seeing various community environment management related programmes: Vision 2020 Umurenge, *Haute Intensite de Main d'Oeuvre* (HIMO), *Ubudehe* and Community Development Fund (CDF) which involve poor communities to participate in various initiatives aimed at enhancing their income so that they can have access to micro-credit and start income generating activities
Ministry of Finance and Economic Planning	Coordinates the National Budgeting, Planning and Financing Framework, including water and sanitation services sector, resource mobilization, and coordination of development partners and allocation of budgets to different Ministries and sectors, overseeing and advising on the formation of various funds (including the Environment Fund)
Ministry of Justice	Develops and advises on formulation of laws and regulations, oversees the formulation and enactment of various laws and regulations including those that are pertinent to the environment and sanitation sector
Ministry of Education	Partners for educational programmes (development of relevant curricula in coordination with Ministry of Infrastructure) and school sanitation programmes, training human resources in the management and protection of environment; funding the construction of schools latrines, oversees the implementation of environmental education programmes in schools (by supporting Environmental Clubs), as well as initiating the process of mainstreaming environment into schools
Rwanda Environment Management Authority	Sets up Environment Standards and Regulations (e.g. Environmental Impact Assessment, etc.) to monitor, inspect and ensure compliance with environmental awareness, enforcement of environmental regulations and awareness promotion campaigns about domestic and industrial solid waste management, implementation organ of environment-related policies and laws, coordinates different environmental protection activities undertaken by environmental promotion agencies as well as supporting local levels in the sector of environment
Rwanda Utilities Regulatory Agency	Ensures that basic services including Water and Sanitation are provided according to the required standards and that there are good conditions for fair completion in provision of those public services (i.e. water and sanitation)
Energy, Water and Sanitation Authority	Water production and distribution countrywide; responsible for urban sewerage systems and sludge emptying services, coordination of all activities related to the programmes aimed at development of water and sanitation, sensitisation of users of water in any way possible, as well as sanitation infrastructure, proper management of water and sanitation, funding the construction of sanitation and water facilities, waste management
National Land Centre	Responsible for Land Administration and Management both at the National and Decentralised level and support the local level in the sector of land
Rwanda Bureau of Standards	Participates in inspection of Sanitation systems of hotels and other businesses along with Ministry of Health and the City of Kigali

Kigali City Council, Districts, sectors, cells	Execute and implement the state regulations on environmental protection at local (city) level, participate in inspection of sanitation systems, hygiene for hotels and in Policy Making process, land and environmental management, urban planning, sanitation plants maintenance, providing drinking water, sanitation, and waste treatment and disposal, mobilise funds (e.g. tax collection as stipulated by law and decentralisation policy), prepare budgets and projects including those related to environment and sanitation, implement government policies and specific projects and participate in policy making process
NGOs, international institutions	Provide Water and Sanitation facilities, especially to the poor, provide technical support, advice in policy making in this sector of sanitation

Table 5 shows that a number of ministries and other central, local and international institutions are currently involved in the sanitation sector. These different institutions have separate responsibilities:

- Policy Development (Ministries);
- Regulations and legal enforcement (Rwanda Environment Management Authority, Rwanda Utilities Regulatory Agency and Rwanda Bureau of Standards, Kigali City Council, Districts, Sectors, Cells);
- Institutions dealing with provision (Energy, Water and Sanitation Authority, NGOs).

It is important to point out that there are some activities that have not yet been started due to a lack of a complete institutional framework. Rwanda Environment Management Authority has for instance legal responsibility for monitoring, inspecting and prosecuting those who pollute the environment. But, specialised courts have not been set up yet. This incomplete institutional framework is not the main issue; rather the big one is duplication of responsibilities within the existing institutions. At the national level for instance, the Ministry of Infrastructure is actively involved in the sanitation funding of latrine projects, policy making and monitoring while at the same time, the Ministry of Natural Resources and Energy, Water and Sanitation Authority are also responsible for funding and regulating sanitation services. Another thing needs to be emphasised: water and sanitation are under the direct control of the Ministry of Infrastructure while Rwanda Environment Management Authority is mandated to carry out all environmental issues; including sanitation but it (Rwanda Environment Management Authority) is under the direct control of the Ministry of Natural Resources.

This clearly shows that Rwanda Environment Management Authority is outside the direct control of the Ministry of Infrastructure, which seems to be the overall coordinator of the sanitation sector. Therefore, the relations between the Ministry of Infrastructure and Rwanda Environment Management Authority are not clear. In addition, there are some institutional conflicts regarding responsibility for environmental health and sanitation. While environmental health is the responsibility of the Ministry of Health, its implementation framework is defined by Rwanda Environment Management Authority. The Ministry of Infrastructure is accountable to the government for sanitation management, but it is not clear whether or not it has powers over other ministries especially the Ministry of Natural Resources and the Ministry of Health or other public institutions like Rwanda Environment Management Authority and the City Kigali, especially in the sanitation sector.

This shortcoming leads to the overlapping of tasks between institutions when implementing environmental policies and laws. While the Ministry of Infrastructure is in charge of sanitation, there is a lack of legal expertise in the environment in the Ministry. At the City level, there are overlaps between the Rwanda Environment Management Authority and the Kigali City Council. The Rwanda Environment Management Authority is mandated to carry out all the environmental matters including enforcing regulations, inspecting and monitoring activities. It is expected to shoulder numerous tasks of inspecting and licensing industrial enterprises, collecting samples, appraising Environmental Impact Assessment processes and imposing

penalties for environmental violations, promoting environmental protection awareness. The problem is that there are various agencies like Rwanda Bureau of Standards, Kigali City Council, and the Ministry of Health with mandates to carry out similar tasks. As such, this makes it difficult for the institutions concerned to define their mandates because laws give the same responsibilities to different agencies.

5 MAIN STAKEHOLDERS IN SANITATION

This section aims at identifying key stakeholders in the provision of sanitation services in Kigali City Council. In order to be brief, stakeholders' roles in the 3K-SAN Project have been summarised in the Table 6. We wish to draw attention to the reader that some stakeholders at national levels often intervene at the city level. This means that sanitation responsibilities are shared between companies/cooperatives/associations (Organic Solutions Rwanda, RHIBATI etc.), local structures (Kigali City Council, Districts, Sectors), national or central institutions (Ministry of Infrastructure, Ministry of Natural Resources, Ministry of Health, Ministry of Local Government, Ministry of Education, Rwanda Environment Management Authority, Rwanda Utilities Regulatory Agency, Energy, Water and Sanitation Authority) and international organisations (World Bank, European Union, UN-Habitat, UNICEF, Belgian Technical Cooperation, USAID, SNV, Water Aid, WHO, etc.).

Box 2: PIGU and WASH Project

***Projet d'Infrastructure et de Gestion Urbaine (PIGU)* is an Urban Infrastructure and City Management Project (UICMP), which covers the City of Kigali and its three districts (Nyarugenge, Kicukiro, Gasabo) and the districts of Huye and Musanze. PIGU supports the Country Assistance Strategy of the World Bank in Rwanda through promoting good governance and strengthening local development by deepening of decentralization; accelerating delivery of infrastructure in order to widen access to basic services for all and improve human capital; increasing investments and strengthening competitiveness of the productive system, and in particular in infrastructure. The main development objective of the project is to improve urban management practices through the development of infrastructure and the provision of urban services to the population.**

The *WASH Project* was initiated in 2006 by the UNICEF Rwanda Country Office to reach the MDGs in the Water, Sanitation and Hygiene sector. Funding was approved and committed by Government of the Netherlands in December 2008 for five years, from the 1st January 2009 to the 31st December 2013

Source: (Sano, 2007)

Table 6: Role of relevant stakeholders for 3K-SAN Project

Level	Organisations	Relevance for 3K-SAN Project
International	WB	Funding experiences, e.g. the recent program "*PIGU*" (Box 2) on slums upgrading, data acquisition, best practices sharing, experts interview, workshops, conference
	EU	Funding experiences, e.g. Lessons from PARES project which upgraded Mpazi ravine along the slums of Bilyogo and Kimisagara, data acquisition, experts interview, workshops, conference
	ADB	Funding opportunities in sanitation sector, e.g. lessons from sewerage finance, data acquisition, sharing information on the best practices, experts interview, workshop, conference
	UN-Habitat	Technical guidelines, best practices sharing, advice in policy design, experts interview, workshop, conference
	UNICEF, BTC, USAID, SNV, Water Aid, WHO	Funding opportunities, e.g. the recent WASH project on promoting sanitation and hygiene (already being implemented by UNICEF), data acquisition, experts interview, workshops, conference
National	Ministry of Infrastructure	Policy, monitoring, regulatory, technical guidelines in water and sanitation, data acquisition, experts interview, workshop, conference
	Ministry of Natural Resources	Policy, monitoring, regulatory, technical guidelines in environment and land, awareness creation in environment and land protection, data acquisition, experts interview, workshops, conference
	Ministry of Health	Policy, monitoring, regulatory, inspecting, technical guidelines in hygiene promotion , awareness creation on sanitation and hygiene issues at community level, data acquisition, experts interview, workshops, conference
	Ministry of Local Government	Community mobilization (experiences of *umuganda*, *ubudehe*), lessons from decentralization, CDF, awareness creation during community works, data acquisition, experts interview, workshops, conference
	Ministry of Finance and Economic Planning	Funding for sanitation, data acquisition, experts interview, workshops, conference
	Ministry of Education	Awareness creation in schools, teaching of environmental issues and their management at school, environmental clubs
	Rwanda Environment Management Authority	Implementing , monitoring activities, awareness creation on environment, data acquisition, experts interview, workshops, conference
	Rwanda Utilities Regulatory Agency	Monitoring, regulating experiences in water and sanitation service delivery, data acquisition, experts interview, workshops, conference
	Energy, Water and Sanitation Authority	Provider for water and sanitation services, data acquisition, experts interview, workshops, conference

10 As discussed earlier, the City of Kigali is divided into Districts comprising Sectors and Cells. Cells are sub divided into villages. Every District in the City of Kigali has its own administration and a legal personality. Without prejudice to laws and the decisions of the Council of the City of Kigali, every District is autonomous in matters of administration and finance and it is administered by its Council. The City of Kigali is responsible for preparing a master plan for the City of Kigali; coordinating the activities of strategic plan of those of Districts comprising the City of Kigali; coordinating developmental activities of Districts in the City of Kigali; following up the implementation of the national policy in the Districts of the City of Kigali; ensuring the security of people and their property in the City of Kigali; providing services which are not delivered at other administrative structures in the City of Kigali

Local	Kigali City[1] (Districts Sectors)	Implementing, inspecting experiences, community works (*umuganda*), mutual assistance (*ubudehe*), awareness creation, data acquisition, experts interview, workshops, conference
	Local NGOs/companies	Important in hygiene and sanitation promotion, interview, focus group discussions, RPA, etc.
	Informal settlement dwellers and sanitation companies	Important in waste collection, beneficiaries, partners in improving their sanitation, catalysts and barriers to sanitation chains in informal settlements, RPA, focus groups discussions, deliberative forums, etc.
	Local leaders at grass roots (umudugudu)	Community works, deliberative forums, etc.
	Academic research institutions (National University of Rwanda)	Collaborative research, Workshop, conference

6 MARKETS IN SANITATION

6.1 Role of public and private sector

The role of public sector in the provision of sanitation facilities is significant. Sanitation facilities are financed by a number of central institutions such as the Ministry of Infrastructure and Energy, Water and Sanitation Authority. There are also other Ministries such as the Ministry of Health and the Ministry of Education which finance their own sanitation projects (sanitation for schools, hospitals). In many cases, the funding organisations play an important role. The official overseas development partners that support the sanitation sector are Germany, Austria, Belgium and Japan. Key multilateral donors include the World Bank, FIDA, ADB, ABEDA, UNICEF and EU. It is important to mention that 70 per cent of the donor funding is channelled and implemented through the national development budget, and only 7 per cent is channelled through NGOs, and this may be due to that donors have confidence in the governance systems (Sano, 2007) and it is in line with the aid Policy adopted by the Government of Rwanda. This Policy draws heavily on the principles of the Paris Declaration. It identifies un-earmarked budget support, followed by sector budget support and standalone projects (Ministry of Finance and Economic Planning, 2006).

With regard to sanitation systems, there is no centralised sewer system in Kigali City. Therefore, individual households, institutions, businesses and industries are responsible for sanitation services. In general, households who can afford it have a septic tank, because it is more hygienic but requires an adequate water supply and costs more to construct than traditional pit latrines which are used by the majority of the population who cannot afford to install a septic tank. The cost of the construction of a complete automatic flushing toilet with a septic tank in Kigali varies between 1,500 to 3,000 US dollars, which is a lot of money for an average resident, while a traditional pit latrine can be around 180-350 US dollars, depending on the material used on the super structure (Sano, 2007). Recently, the cost of a pit latrine has dramatically risen because of the government's new law, which bans unauthorised cutting of trees, with the rarity of trees making them expensive. This has also resulted in high prices of fired bricks.

6.2 Sanitation chains in market sanitation

Although significant achievements have been made in solid waste collection, there is still a long way to go for faecal sludge management. In Kigali City, in high-income areas, excreta are collected, transported and disposed of at the Nyanza dumpsite. Sometimes, waste is treated and re-used for other purposes. Suitable treatment can result in waste streams being converted into a valuable resource for reuse. Reuse of treated excreta offers significant benefits both in terms of reducing the need to find safe disposal sites for wastes and because the waste itself contains nutrients which are an important resource for agriculture or energy generation, either at a large scale (wastewater treatment plants with co-generation) or at the domestic/ community level through bio-gas generations.

In informal settlements, when the latrines are full, there are several options. Firstly, the householders can dig another pit latrine but space is an issue. However, if pits are not emptied and cannot be moved, then they cannot be used and households will revert to open defecation. There is even a local saying *bantya he*? meaning *where to defecate?* because they do not have toilets. Secondly, householders empty pits or pay private operators (unknown individuals) to do so. Waste is often dumped in the runoff when it is rainy in the night. Thirdly, households from these slums or renters inject *Organic Solutions*. These organic products facilitate decomposition of organic matter (including human wastes). This environmental sanitation approach is being promoted by Organic Solutions Rwanda (OSR) Ltd through the sale and sometimes donation of organic solutions because they are not always affordable for the poor. During our study sites visit, one resident of Kimicanga talked about organic solutions. According to him, organic solutions controlled smells but he added that organic solutions remained expensive (OSS 1 lit. for 5 US $). It is important to mention here that in order to be effective, one litre of organic solutions needs to be used a week for a household. We will need to explore this in details during the fieldwork phase.

As far as the costs of empting are concerned, it is difficult to know them because it remains a secret between either the house owner or the house renter and the emptier. What is known is that little on-site

waste reaches the treatment plant and most ends up in nearby rivers/swamps. In informal settlements of the City of Kigali, considering the entire sanitation value chain would be critical. In the medium-long term, sustainable access to sanitation is dependent on having accessibility, appropriate transport, treatment and disposal/re-use options, which means that all steps of the value chain would need to be adequately organized and financed. Private investments in Water and Sanitation infrastructure are being encouraged and supported by the Government. The Ministry of Infrastructure is considering options to leverage private capital investments by providing low-interest loans, through output-based aid (OBA) or co-financing.

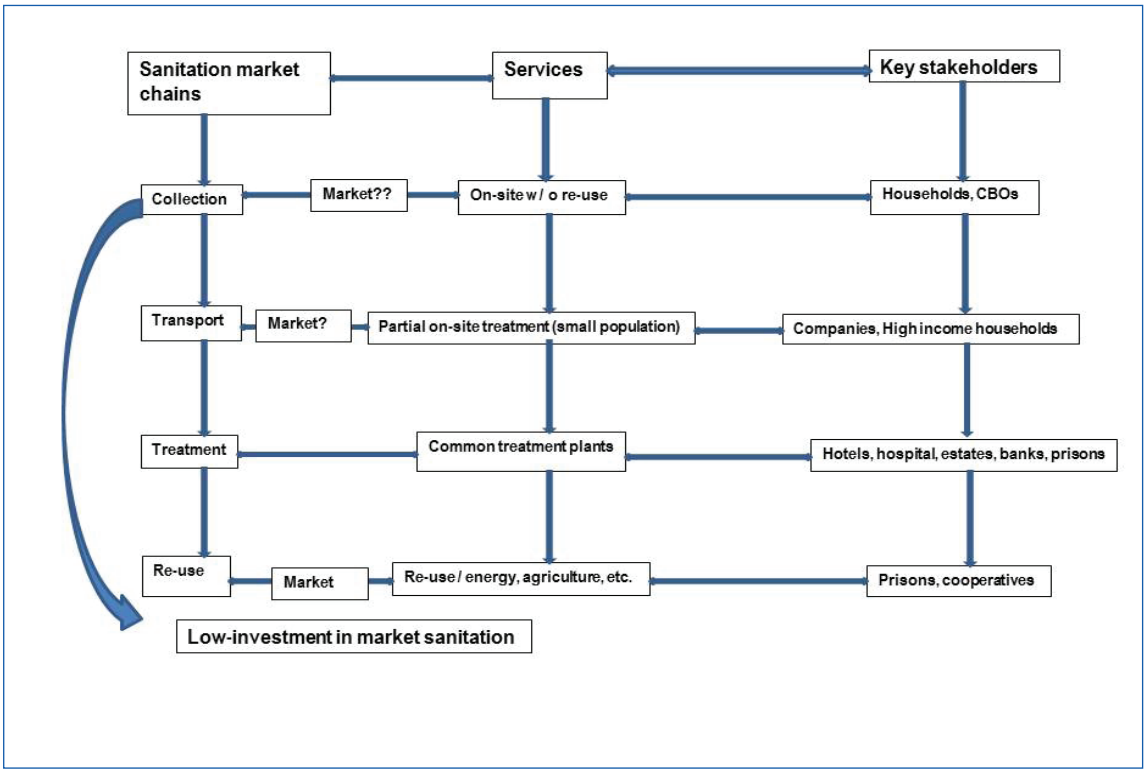


Figure 12: Market sanitation chains in the City of Kigali

In middle and high-income households, the sanitation chains exist but they are still underdeveloped (Figure 12). It is worth mentioning here that in the City Kigali, there are some few semi-collective treatment plants (Figure 13) which belong to various institutions. Few companies are involved in waste empting. Only the Ministry of Defence and Airport Civil Aviation Authority collect waste from public areas. The wastes from individual households are mainly collected by the private company called *Kigali Septic Service*. The cost varies between 120 and 150 US $. There are also two other small companies. In an ideal world, without financing constraints, providing sustainable access to sanitation would require that services be provided alongside the entire value chain, so as to deliver the maximum health benefits as well as protection for the surrounding environment. This is what most developed countries currently aim for and most of them have gradually been tightening wastewater treatment requirements, for example, so as to ensure maximum protection for the environment.

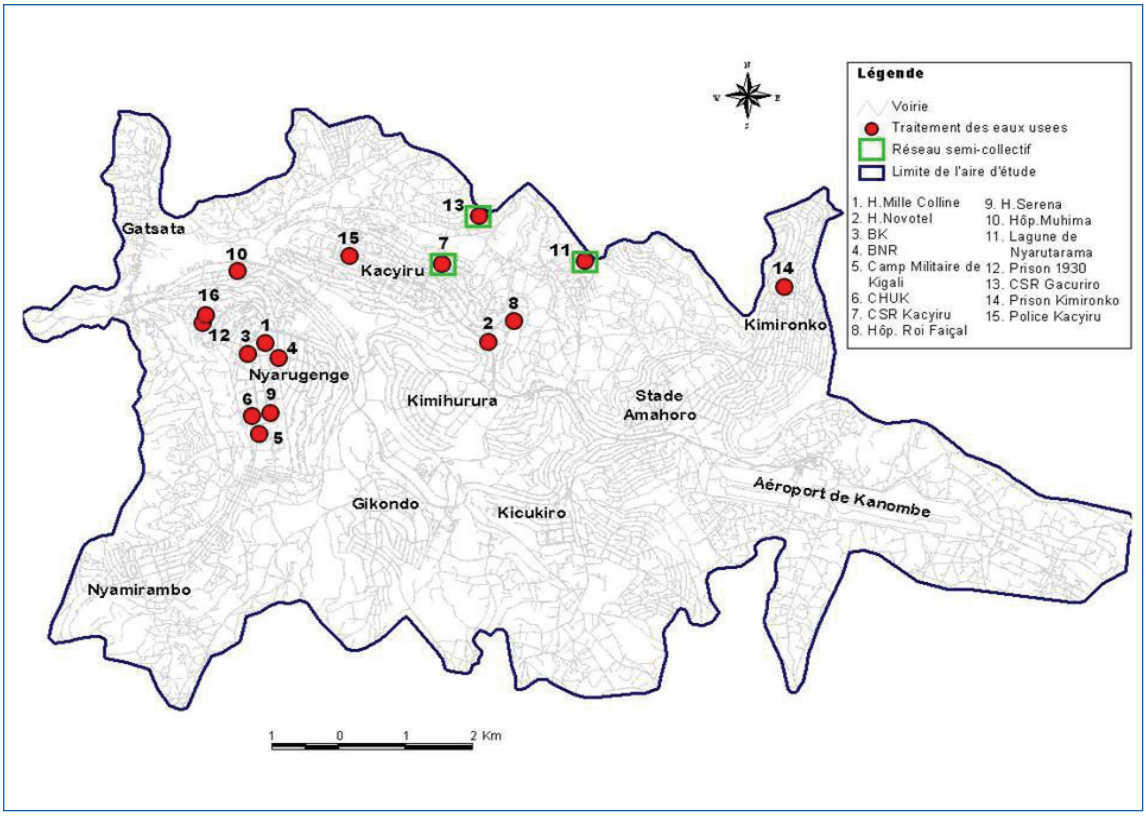


Figure 13: Small semi-collective treatment systems of various institutions

Source: (ELECTROGAZ, 2008)

In City of Kigali, access to sanitation is a challenge even in middle and high-income households. This situation is worse in informal settlements where the high density of housing increases the negative health implications of both open defecation and unregulated emptying of pit latrines. This is due to the fact that sanitation chain is poorly organized and regulated. The lack of funding is exacerbating the situation. Limited returns from poor settlements create difficulties for Community Based Organisations and companies to grow. Re-use activities even if they exist, tend to be limited to prisons and are not affordable for poor-households of informal settlements.

Sanitation facilities that allow the re-use of excreta have a reputation for being costly, and difficult to implement at scale after the pilot projects. There is thus a need to better organise markets for re-use in Kigali City. Overall, financing the sanitation sector in a sustainable manner is notoriously difficult. Charging for sanitation is challenging, as households are often poor and are reluctant to pay for sanitation services, as they do not perceive their immediate benefits. There is a lack of clarity on "what" should be financed. A multitude of actors provide sanitation services, ranging from households themselves self-providing the service, local governments, utilities, companies, independent providers usually operating informally in informal settlements.

For solid waste collection, it is developed since there is a monthly billing system. Estimates of Community Based Organisation coverage are well over 90 per cent, with each household paying approximately 2000-3000 FRW (3-5$US) per month for weekly collection services. It is probably only the poorest who dispose of their waste in public areas. However, Community Organisations still use rudimentary methods for garbage collection with little protection against disease. While affluent settlements are served by specialised companies for waste collection, the informal settlements are served by Community Based

Organisations owned mainly by women who lack resources and skills to operate a collection service.

In addition, the construction sector is weak; there is a lack of qualified craftsmen, masons, artisans and adequate sanitary technology know-how. Private sector is at its early stage and therefore markets for sanitation services have not been established. The recycling waste is not yet developed apart from some few companies which used to intervene in high-income areas. There is an under-investment by both small-scale entrepreneurs and utilities in sanitation markets.

6.3 Credit and savings

The lack of access to credit is widely regarded as a major hindrance for catalysing self-sustaining sanitations chains, especially for the poor urban communities. This absence of funding does not allow landowners to invest in sanitation and hinders the growth of a sanitation market. In Rwanda, microfinance options exist but are not pro-poor oriented (Fin Mark Trust, 2008). This constitutes a barrier to improved sanitation. However, Rwanda has recently adopted a Financial Sector Development Program (FSDP) in order *to develop a stable and sound financial sector that is sufficiently deep and broad, capable of efficiently mobilizing and allocating resources to address the development needs of the economy and reduce poverty.* The Financial Sector Development Program has been made one of the key components in the Economic Development and Poverty Reduction Strategy 2008-2012 of Rwanda and has four core objectives (Box 3).

Box 3. Core objectives of Financial Sector Development Program

- **More than half of the Rwandan adult population (52%) manage their lives without using any kind of financial product (formal or informal);**
- **More than half (54%) of the 48 per cent of Rwandan adults who do use financial products, use informal products;**
- **Of those who are using formal financial products, most (67%) are using formal bank products;**
- **Bank usage is dominated by the *Union des Banques Populaires du Rwanda* (UBPR). Excluding UBPR, only 1 per cent of the adult population use commercial bank products.**

Source: (Fin Mark Trust, 2008)

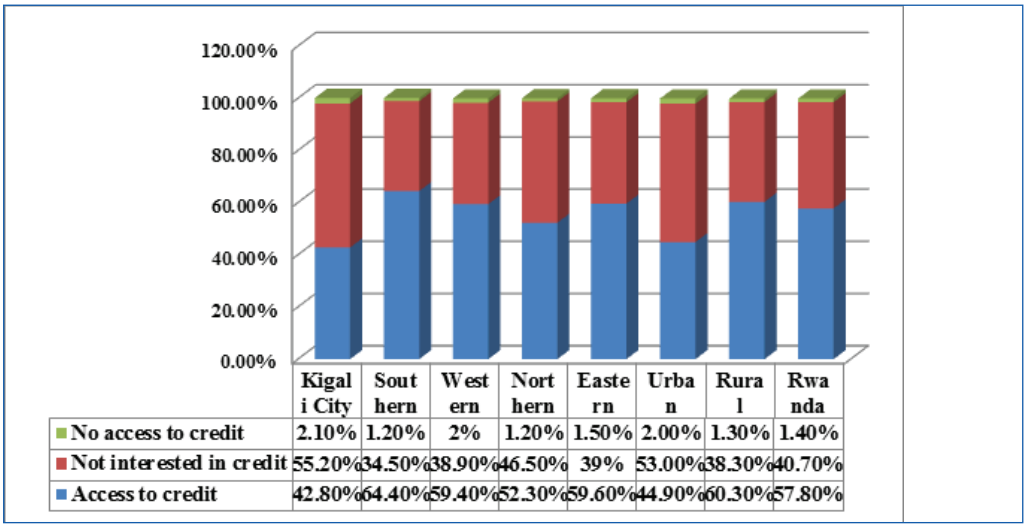
In general, 86 per cent of adults in Rwanda do not use formal banking products. The main barrier to banking is related to lack of income. Rwandans either do not have a cash income or they do not perceive a bank account to be of value as they "do not have enough of their income left after daily living expenses (Fin Mark Trust, 2008). Other barriers to finance are lack of collaterals as well as pro-poor products and providers. Also, the interests are high (more than 20%) and the loans are for short periods. The financial sector is made up of formal service providers (Banks) and informal micro-finance institutions, savings and credits cooperatives and money lenders. With 14 per cent of the adult population using banking services, Rwanda faces greater challenges compared to the East African countries where Fin Scope has been conducted. In terms of the proportion of the adult population being financially included (i.e. using either formal or informal financial products), Rwanda (47%) lies second with only Kenya (57%) illustrating higher financial inclusion (Fin Mark Trust, 2008) (Box 4).

Box 4. Access to financial services and products in Rwanda

- **To enhance access and affordability of financial services;**
- **To enhance savings mobilization;**
- **To develop appropriate policy, legal and regulatory framework for non-bank financial institutions; as well as;**
- **To organise and modernise the national payment system.**

Source: (Fin Mark Trust, 2008)

Figures 14 and 15 allow us to see growth in the numbers of households that have access to credit from 2005-6 to 2010-11.



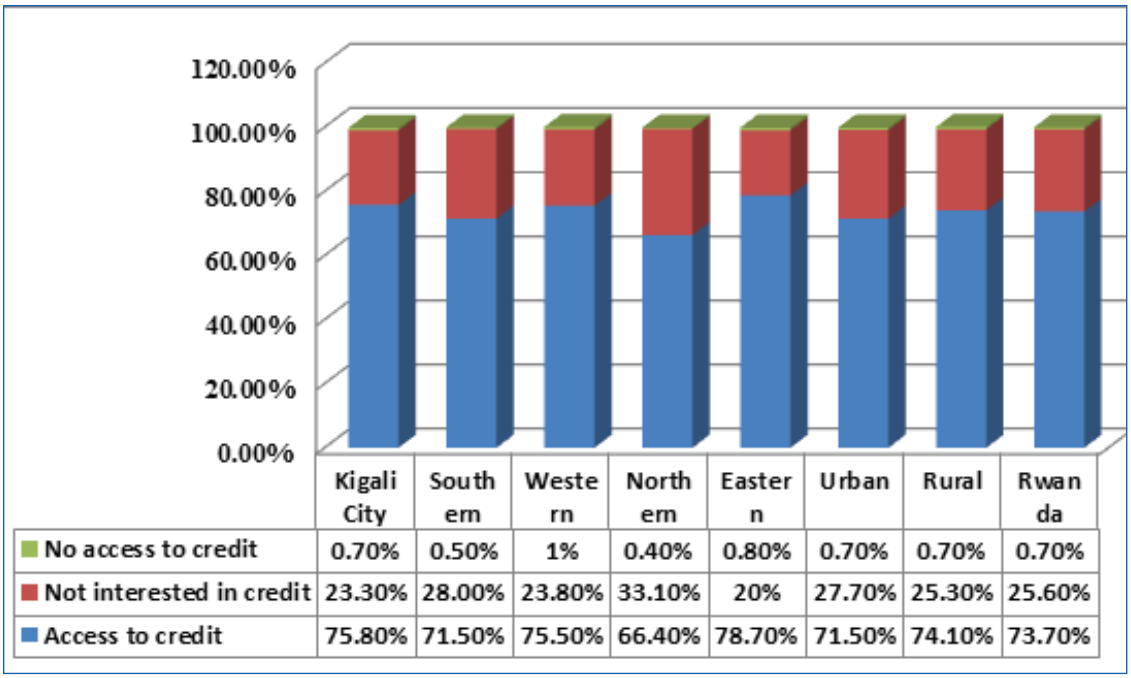
	Kigali City	Southern	Western	Northern	Eastern	Urban	Rural	Rwanda
No access to credit	2.10%	1.20%	2%	1.20%	1.50%	2.00%	1.30%	1.40%
Not interested in credit	55.20%	34.50%	38.90%	46.50%	39%	53.00%	38.30%	40.70%
Access to credit	42.80%	64.40%	59.40%	52.30%	59.60%	44.90%	60.30%	57.80%

Figure 14: Access to credit by provinces and urban/rural in 2005/6

Source: (National Institute of Statistics for Rwanda, 2012b)

In Rwanda, 73.70 per cent of households have access to credit. This needs to be clarified because people borrow money mainly from friends, relatives and other informal sources. The proportion of people having access to credit through formal or informal institutions is very low. People would not generally borrow from friends/relatives to invest in sanitation. Such borrowing is generally to tide people over to the next pay day, in an emergency or to manage risk. Less than one per cent of household does not have access to some form of borrowing with 25.6 per cent not having sought credit in the 12 months prior to the survey.

Compared to 2005/6, 16 per cent more households had credit in 2010/11with a similar reduction in the proportion of households with no access to credit. This may suggest that many more households are now able to access credit. It is important to mention here that households in Kigali City have improved access to credit by more than their rural counterparts, as shown in figures 14 and 15.



	Kigali City	Southern	Western	Northern	Eastern	Urban	Rural	Rwanda
No access to credit	0.70%	0.50%	1%	0.40%	0.80%	0.70%	0.70%	0.70%
Not interested in credit	23.30%	28.00%	23.80%	33.10%	20%	27.70%	25.30%	25.60%
Access to credit	75.80%	71.50%	75.50%	66.40%	78.70%	71.50%	74.10%	73.70%

Figure 15: Access to credit by provinces and urban/rural in 2010/11

Source:(National Institute of Statistics for Rwanda, 2012b)

This improvement in access to credit may be explained by the recent establishment of *Umurenge SACCOs* (Box 5), which encourages savings and enable the poor to have access to loans. However, the amounts saved by most households are small and are generally difficult to manage.

Box 5. Umurenge SACCO

The National Dialogue Meeting of December 2008 proposed a strategy of integration of the poor population in the financial system. With Umurenge SACCO, at least one SACCO is set up within each Sector *UMURENGE* throughout the country". In order to attain this objective the following actions are undertaken:

- Make census and mapping of SACCOS and other MFIS, branches and counters per sector;
- Identify Imirenge with no point of services by any SACCO;
- Sensitize the population for organizing all activities through cooperatives;
- Provide support to SACCOs with non-performing loans recovery problems.

Source: (Angelique Kantengwa, 2010)

7 SANITATION SERVICES PROVISION AND PRACTICES

7.1 Sanitation provision

Most of Rwandan households have already financed and built their on-site private sanitation premises, although only about half comply with the Joint Monitoring Programme criteria for improved sanitation. Very few Rwandan households have installed flush toilets. The prevailing practice remains that water is used for cooking and washing (grey water, discharged mostly on surface) while the pit latrines dispose the excreta. It is important to point out that using a pit latrine is a rational solution considering the scarcity of the water supply. The country has not yet invested in collective (water-borne) sanitation systems for densely settled urban areas, except the few small ones indicated earlier. Major hotels, hospitals and some industries have installed their own pre-treatment systems as discussed earlier. Total latrine (or toilet) coverage in Rwanda is 96 per cent (National Institute of Statistics for Rwanda, 2012b). There are various political, social and cultural factors that may help to explain this. Colonial rules and regulations played an important role by establishing public hygiene laws as far back as 1926. A decree from 1959, for example, enforced the construction of latrines in every house, shop, and establishment.

7.1 Sanitation practices in Kigali

7.1.1 Unpiped individual: pit latrines

According to the Kigali Waste Water Master plan (SGI-Projema, 2008), more than 95 per cent of the population uses on-site individual sanitation. About 80 per cent use pit latrines, of which the vast majority are traditional designs. There is a government campaign carried out through local leaders to have clean, non-smelly, covered latrines with concrete slabs (Alexandra Hohne, 2011). Local authorities monitor the hygiene situation in the 100-350 households for which they are responsible. There are few statistics on sanitation issues, but estimate figures show that on average, four households in the City of Kigali share one pit latrine (OZarchitecture, 2007). In interviews with a few people who shared toilets, Alexandra Hohne came to a conclusion that they were mostly tenants renting from the same owner (Alexandra Hohne, 2011). One toilet was located in a valley wetland and was used by all the surrounding households who did not have their own facilities. The families could not estimate how many people would use it.

The responsibility for the sanitary facilities lies, according to the law, with the house owner. However, often tenants who install the sanitation may pass on the costs to the owner. Most interviewees (owners and tenants) said that they dig a new hole when the old one is full (Alexandra Hohne, 2011). They can find workers in certain areas, who will do that or some people exchange telephone numbers of good workers. It was claimed, that those workers never come from their own neighbourhood. If young people belong to the household, they might decide to dig the hole or at least to construct the superstructure themselves to reduce costs (Alexandra Hohne, 2011). Usually the contractor of the latrine will make a pit that is as deep as possible to maximise the life of the latrine. The considerations for the depth are firstly, how many meters the latrine owner can afford to be dug and secondly groundwater level. The old pit is often covered with the remains of the superstructure or with concrete, on which a room can be constructed (Alexandra Hohne, 2011).

7.1.2 Piped individual sanitation

A few households have soakage pits/ leach pits to store faeces (Alexandra Hohne, 2011). Water-based sanitation is usually found in households with higher income, as it requires high investments and stable water availability. This system is more common in the city centre and other areas with multi-story buildings. Tanks and pits have to be emptied when sludge has accumulated (Alexandra Hohne, 2011). Sludge removal poses less of a problem if the pits are lined and thus more stable, if the owners generally have a higher income to pay workers and if their houses are located on accessible roads (Alexandra Hohne, 2011).

7.1.3 Piped common sanitation

Institutions and high rising buildings are required by law to have their own treatment facilities, which are generally septic tanks (Umuhoza, 2007). Besides two bio disks, most commonly they are activated

sludge systems. They are found in hotels, hospitals, banks, prisons and estates. The Social Security Fund of Rwanda (Caisse Sociale) has invested in at least three estates with common treatment. Some institutions, like the 'Green Hills Academy' and the Kimironko prison, Vision 2020 Housing Estate as well as the estate Batsinda, implemented biogas producing sanitation facilities (Alexandra Hohne, 2011).

7.1.4 Open defecation

Open defecation is estimated to be very low at about 3 per cent and has been reported in low population density areas in peri-urban Kigali (Joint Monitoring Programme, 2011).

7.2 The challenges of the current sanitation practices in Kigali

The following challenges are mainly based on Hohne's analysis (Alexandra Hohne, 2011) and informed by our interviews with residents and Kigali City officials. According to our interviewees, many challenges are rooted in the number of people living on a limited space. The quantity of waste can easily exceed the carrying capacity of the location, causing health, environmental and aesthetic problems (Alexandra Hohne, 2011). Furthermore, challenges of financing, erosion and water supply put pressure on the status of sanitation provision.

7.2.1 Health

The open storm water drains are not only polluted with grey water, but also with other waste. Especially during rains, latrine pits, septic tanks or soakage pits sometimes overflow or are discharged. Particularly children playing in the area of flowing sludge can get infectious disease, like diarrhoea, as pathogens are present in the environment (Alexandra Hohne, 2011). This problem has decreased since the Kigali City Council put a department of inspection of infrastructures in place (Urwibutso, 2008). The ways of transmission are various. The lack of fresh water and soap in the house can hinder people from hand washing and uncovered pits or stagnant black water can attract flies. Effluent from tanks and pits can pollute surface and ground water used for human consumption with pathogens and pollutants. There is also a problem of waste management in Kigali, with untreated sewage being disposed of on dump sites, posing a threat to health. Waste is also disposed of into ditches, drains and open spaces. These practices pose a threat to public health (Rwanda Environment Management Authority, 2011). The disposal of untreated waste is also a problem in other urban areas.

7.2.2 Aesthetics

Waste in the streets and open drains decreases the aesthetic quality of the neighbourhoods (Alexandra Hohne, 2011). Many interviewees have also complained about smell from neighbouring toilets or standing water and waste within the community. Often they wish to have better kept green spaces.

7.2.3 Finances

Many interviewees stated that the quality of their facilities depends mostly on their financial situation. Some felt left alone by the government, as they did not offer soft loans for domestic improvements. One house owner claimed that the government is demanding and monitoring, but not providing support to improve the hygiene situation (Alexandra Hohne, 2011).

7.2.4 Limited space

A full latrine is problematic. Emptying is rarely done, as the pits are generally not lined with bricks and can collapse after a period of use. For the soakage pits and septic tanks there are only few suction trucks available and often they are not able to access the narrow steep roads that lead to the toilets (Alexandra Hohne, 2011). In those areas, pits are emptied manually, mostly during the night. Neither in the literature nor in my field interviews did I find any facility offering 'vac trucks' or other small pumps that can access the inside areas of Kigali's neighbourhoods to empty pits. One house owner stated her latrine pit was about to be full, but there was no more space, where she could dig a hole.

7.2.5 Water provision

During the dry seasons, Kigali lacks water. The owner of a local industry in one of the neighbourhoods

reported that the water is cut off on purpose in certain areas to assure the delivery of water to other areas (Alexandra Hohne, 2011). It is estimated that Kigali households with flush toilets use 20-30 litres per person a day for the toilet (Umuhoza, 2007) and thus pose a risk to the stable water provision.

7.2.6 Erosion and its risks

As drains are often canals in the soil without concrete lining, they become eroded and cause further erosion during heavy rains (Alexandra Hohne, 2011). Three interviewees had to leave their houses due to destruction through rain. Recently, the Government started promoting the use of soakage pits for grey water although concrete activities to re-use grey water had not yet commenced. More than 50 per cent of the people are using them (Sano, 2007), but other studies found that they were rare (Alexandra Hohne, 2011).

7.2.7 Environment

The soil can filter a certain amount of pollution from the effluents of tanks and pits. If the density of these pits is too high, however, the absorption capacity of the soil is restricted, depending on soil type and layers (Alexandra Hohne, 2011). If the current demographical development continues without a system change, eutrophication of water bodies in Kigali is predicted due to the bad effluent qualities (Umuhoza, 2007). A major challenge is waste dumped in the drains and flushed down into the downhill areas (Nkuranga, 2007). If there is a possibility to empty pits, the sludge is not always disposed in a proper manner. Visiting the Nyanza dumpsite, we saw an open sludge lake, where the suctioning trucks officially discharge sludge. An interviewee claimed some neighbours would leave sludge on an empty space within the area at night.

8 POPULATION'S ATTITUDES AND PERCEPTIONS ON SANITATION

This section focuses on residents' attitudes and perceptions about sanitation in Kigali. It is mainly based on Hohne's research in three slums of Kigali City (Alexandra Hohne, 2011). The focus is on what people think is *good sanitation*, what are *appropriate technologies* and in how far they believe to have *access* to different sanitary options.

8.1 Good sanitation

Good sanitation can encompass a variety of aspects. In his interview, Alexandra Hohne selected opinions that presented how inhabitants would like hygiene and sanitation to be in selected three neighbourhoods. People were asked to rank criteria of good sanitation between low investments, returns, cleanliness/outlook, health, environmental pollution and workload. Cleanliness and health are seen as most important criteria for good sanitation amongst the three neighbourhoods. Indicators for bad hygiene that people mentioned most are bad smells and flies. They know from awareness training that flies can be vectors for diarrhoea; and amongst others one nurse claimed that smell could cause respiratory infections and even lung cancer (Alexandra Hohne, 2011). Even though health was a priority, none of the respondents stated, that their children had diarrhoea more than three times per year.

Workers at three local health centres ranked environmental pollution high (Alexandra Hohne, 2011). Asking for more details, Alexandra Hohne found out that his concept of natural environment is rather understood as living environment. Concerning returns, some people were surprised about the criteria '*returns*', as they were not or were only vaguely familiar with the possibility of using treated human faeces as fertilizer or of producing biogas for cooking (Alexandra Hohne, 2011). '*Returns*' as such was then also ranked high. When Alexandra Hohne asked people how they would like to improve their neighbourhood, many people mentioned aesthetic improvements like painted houses or better green areas. They also desire better infrastructure such as drains and roads. In fact, many interviewees said that aesthetics and drains and roads were more urgent to change than the quality of latrines. Better toilets are also on the wish list, but are not a priority (Alexandra Hohne, 2011).

8.1 Appropriate technologies

Many people do not feel that they actually have the choice between different technologies (Alexandra Hohne, 2011). With respect to technology and design, one interviewee claimed, that people are too satisfied with their current toilets to invest into a new system. Often people do not give much attention to the design of their toilet and what impact this would have on them and their environment. For most interviewees, the *user interface* was in the centre of attention when talking about sanitary technologies (Alexandra Hohne, 2011). The toilet system as a whole receives attention when it needs maintenance or replacement. There are also some exceptions where people really thought of their sanitary system. When asked to describe good technologies, people usually focus on details of technologies they use (Alexandra Hohne, 2011). Pit latrines are most common. Concrete slabs can be cleaned with water and are considered appropriate (Alexandra Hohne, 2011), as promoted by the authorities. In addition, a good superstructure is important for the inhabitants. If water can enter through missing or leaking roofs or doors, pits can overflow and cause smells and dirty stagnant water in the streets. People in the three neighbourhoods do not desire a shared toilet, as *others* do not maintain them well (Alexandra Hohne, 2011). It is difficult to share the responsibility of cleaning and particularly when children are using facilities they are often dirty. One interviewee claimed that some people prefer to defecate in front of the toilet, if the inside was inappropriate (Alexandra Hohne, 2011). However, sensitisation efforts made by authorities are changing this behaviour.

Moreover, people often think of flush toilets as modern. They usually know them from hospitals and offices and claim that they are more hygienic and therefore healthier (Alexandra Hohne, 2011). Two interviewees claimed that the transmission of pathogens is not depending on the technology, but rather on practices like washing hands with soap or covering the pit. For house owners, an important advantage of septic tanks and soakage pits is that they do not have to dig new holes regularly. Tank owners rarely mentioned

poor road access as limiting for the emptying (Alexandra Hohne, 2011). This is probably because there are workers available, who can manually empty stable pits. The use of faeces is generally seen controversially. Some people remember *arboloos*, where villagers traditionally plant bananas on filled shallow pits. Some do not mind using this fertilizer also for other crops (Alexandra Hohne, 2011). However, the value of the fertilizer is economically perceived to be very low. Other interviewees claim that the use of faeces is new in Rwanda and would often refuse it. Rwandans are most familiar with cow dung.

Technologies like Eco-San and bio-gas that involve the use of faeces as fertilizer or for the production of biogas are vaguely known. Usually people have heard of biogas from TV and radio (Alexandra Hohne, 2011). They know that farmers get a bio-gas plant for cow dung and that they are implemented in prisons and schools in Kigali City. People who have passed by those prisons often noted the disturbing smell in the pilot phases or at least heard about it. An interviewee involved in biogas construction claimed that bad smells due to technical problems at one of the prisons' biogas plants destroyed the technology's reputation (Alexandra Hohne, 2011). Technically, a prison is a suitable location for bio-gas, as many inmates provide manure and the biogas can be used in the central kitchen. Socially people might associate it as a punishment requiring inmates to cook by using their own faeces. Eco-San is less known within the communities (Alexandra Hohne, 2011).

In addition, some people have heard of the public Eco-San Urine Diversion Dehydration Toilet (UDDT) in town and in Nyabugogo station, but generally, they know that they are implemented in rural areas. None of the interviewees had ever used such a toilet. The local leaders were asked what system they wish for their neighborhood. In Urugero, where one inhabitant is implementing the biogas show case, he would like to have a piped biogas system for all (Hohne and Dusingizumuremyi, 2011). The leader in the rather peri-urban area stated he wanted VIPs for the people on the upper hillside and Eco-San for the downhill parts with high groundwater level. The local leader of the commercial center who is also a multi-story house owner knows that there is a new complicated system going to be implemented in her area (Alexandra Hohne, 2011).

8.1 Perceived accessibility

Interviewees saw a major constraint for improved sanitation at home in their financial situation. In the peri-urban neighbourhood, several people stated that if they had more means, they would prefer moving to another area (Alexandra Hohne, 2011). Some interviewees reported having to save for a new toilet before the pit is full. Others without sufficient resources depend on social networks. They use the neighbours' toilet until they can afford to renew theirs, if they are in good contact or take loans from the family, if available (Alexandra Hohne, 2011). In very serious cases, widows for example can ask the local leader to organize community work (*Umuganda*), where all neighbours come together to help with the construction. In some areas the church or mosque community can take on this role. Some inhabitants would not be able to pay a monthly fee for the obligatory sewerage connection in some areas, as they are already not always able to afford water (Alexandra Hohne, 2011).

Most interviewees would hesitate to invest in new technologies. According to the implementer of the biogas showcase in *Urugero* only a third of his neighbours were theoretically willing to connect. They often claimed the connection was too expensive. This reluctance might be explained by the unwillingness to take risks with a system they are not familiar with (Hohne and Dusingizumuremyi, 2011).One woman was desperately looking for a solution to the lack of space for a new latrine. She did not consider connecting to the biogas system that was about to be established in her neighbourhood. Even though she knew of the initiative going on in the neighbourhood, she said: "*I don't pay attention to things that anyways will not come to me*". The house owner had never heard of a domestic biogas system before (Alexandra Hohne, 2011). She did not consider this new technology as part of her life world and therefore did not take it as a serious possibility for her household. There seem to be typical designs -pit latrines and flush toilets with septic tanks- that are often copied. Usually people stick to technologies they have always used and that they consider appropriate for their socio-economic status (Alexandra Hohne, 2011).

9 LOCAL INITIATIVES AND ACTIVITIES FOR IMPROVING SANITATION

In light of the challenges due to unimproved sanitation, there are some local initiatives at different levels for improving sanitation. At the national level, the government is planning a conventional sewerage system for the central areas and is promoting septic tanks, *VIP* and Eco-San for others as a precondition to fulfil the Vision 2020. The central sewage system will be located at Gitikinyoni and it will link Nyarugenge, Kimihurura, and Kacyiru, the main areas where most of the big construction projects are taking place. There will be a network of big and small pipelines to which every house and building in those areas will be connected. However, this initiative is not pro-poor oriented. Wastewater will be treated in the central sewage system to be used for other purposes (Rwanda Focus, 2010). For other areas, smaller local treatment plants similar to the one in Nyarutarama will be used. Already, the social security fund implemented the innovative estate *Batsinda*, where four households share one biogas plant. Also, the Government, in partnership with UNDP/UNEP is in the process of operationalizing a National Fund for the Environment. Also, two master plans have now been completed for Kigali City, one a conceptual plan by Oz Architecture of Denver in 2007 (OZarchitecture, 2007), the other a detailed district plan by Surbana of Singapore (2009) giving details of the future central business district (CBD) of Kigali City, in Nyarugenge District (Alexandra Hohne, 2011).

There are some projects in-progress. For instance, UNDP assisted by Fukuoka University, is investigating the possibility of utilising the Fukuoka method to process Kigali's waste. This method utilises semi-aerobic decomposition and is suited to Kigali's waste thanks to the very high organic content (~70%) of the collected waste. Since 2004, Kigali City with the World Bank funded *PIGU* project, is working on upgrading slums and this has improved the lives of dwellers. There are several innovative sanitation and hygiene initiatives that are being implemented in Rwanda such as the hygiene and sanitation campaigns; the creation of the Community Health Workers ; the launch of the Community-Based Environmental Health Promotion Programme; the Hygiene and Sanitation Presidential Initiative (HSPI); the formation of environmental clubs at schools; and the formation of Community Hygiene Clubs in all villages to facilitate maximum involvement of all households in the sanitation and hygiene promotion (Box 6). GBEHPP absolutely complements the Ministry of Infrastructure efforts to provide safe drinking water and sanitation infrastructure by ensuring that the potential health and poverty reduction outcomes can also be achieved and sustained.

Box 6. GBEHPP Approach

Urban and rural sanitation are heavily dependent on household contributions, which require significant effort from Government in terms of promoting and marketing access to sanitation. This is primarily being done through the Government-Based Environmental Health Promotion Program (**GBEHPP**) which has adopted a community hygiene club approach supported by 45,000 community health workers. A **GBEHPP** road map was launched in December 2009, and Government is encouraging 'partners' to support the program. There are no subsidies for communities, who must try to graduate from a course which covers 20 topics including hygiene and sanitation. Training for members of the community hygiene club includes methods of constructing a tippy tap or building a lid for latrines. The facilitator signs off once they have completed all the topics and there will be a formal graduation ceremony for the village. Progress under **GBEHPP** is measured through '7 Golden Indicators': increased use of hygienic latrines in schools and homes from 28 per cent to 80 per cent; increased hand-washing with soap at critical times from 34 per cent to 80 per cent; improved safe drinking water access and handling in schools and homes to 80 per cent, establishment of CHCs in every village from 0 per cent to 100 per cent, achieve Zero Open Defecation (ZOD) in all villages to 100 per cent, safe disposal of children's faeces in every household 28-100 per cent; households with bath shelters, rubbish pits, pot-drying racks and clean yards to increase to 80 per cent.

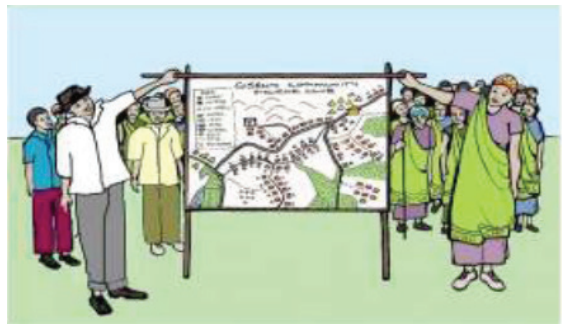


Figure 16: Manual for CHC facilitators, community health workers and district environmental health officers

In addition, a Participatory Hygiene and Sanitation Transformation (PHAST) program was initiated to promote hygiene and sanitation by influencing positive behavioural change and adoption of better practices among Rwandan communities and *Hygiene et Assainissement en Milieu Scolaire (HAMS)* program (since 2000) which focuses on behaviour changes in hygiene practice in Rwanda's schools. HAMS aims at decreasing water and sanitation related diseases and its main objective is to speed up behaviour change in terms of sanitation and hygiene via the school population. The approach includes sensitization and mobilization of the Rwandan community to adopt hygienic practices, and sustainable improvements of water and sanitation infrastructures. Children learn some of their most important hygiene skills at school and hygiene practices are included in the curriculum. Also, formalizing traditional elements into administrative frameworks has been a particularly successful strategy in Rwanda in promoting sanitation. For instance, adapting *Imihigo* (Box 7) *is* a means to publicly commit to achieve specific goals including sanitation promotion; the *Ubudehe* (Box 7) program, based on the tradition of mutual assistance, provided a successful network that helped the government target and support poor households in sanitation. Similarly, *umuganda* (Box 7) has contributed much to sanitation promotion. The decentralization process provides an adequate framework for community participation, sensitization and is part of the Community Development Policy.

Box 7. Traditional customs formalised into administrative systems

Imihigo: is a tradition that Rwanda has institutionalized as a practice where people publicly committed themselves to the achievement of a given task. Breaking this commitment was considered a great dishonour for the individual and the community. Following the government's strategy to decentralize decision making, Imihigo was resurrected in 2006-2007 in the form of contracts between the President and district mayors;

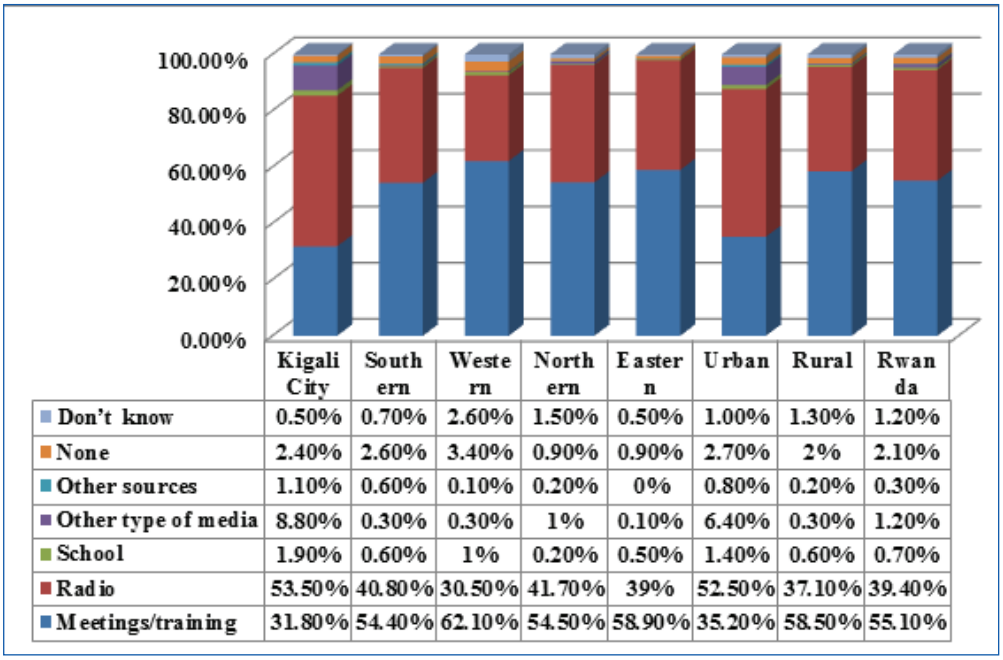
Ubudehe: the tradition of mutual assistance or local collective action. Households are classified by the community into five categories with the lowest two being eligible for social protection such as free membership of the mutual health insurance and Vision 2020 Umurenge;

Umuganda: a traditional cultural practice predating the colonial years that has used in various forms to mobilize labour, usually for work on public projects. It means community works and it is organised once a month of every last Saturday and it is compulsory.

Source: (Nitin Jain, 2011)

Currently, the Government is working with AFRITANK, to provide mobile toilets, as well as toilet slabs, all in effort to provide clean hygiene and sanitation facilities and services. The government are educating people on the best hygiene and sanitation practices by mobilizing the mass media (radio and TV drama programmes such as *Urunana*, booklets and posters), and arranging meetings at the village after the community work (*umuganda*) that takes place on the last Saturday of every month,. Figure 17 presents the main source of information related to environmental issues. More than 50 per cent of households in

four provinces claim they have received some form of training or meeting informing them about environmental issues (National Institute of Statistics for Rwanda, 2012b). Such training sessions or meetings are reported by 32 per cent of Kigali City residents. Another 39 per cent state that the radio is their main source of information on such issues. In Kigali City this is even higher, with 62 per cent stating that their main source of information is either the radio or another type of media (National Institute of Statistics for Rwanda, 2012b).



	Kigali City	Southern	Western	Northern	Eastern	Urban	Rural	Rwanda
Don't know	0.50%	0.70%	2.60%	1.50%	0.50%	1.00%	1.30%	1.20%
None	2.40%	2.60%	3.40%	0.90%	0.90%	2.70%	2%	2.10%
Other sources	1.10%	0.60%	0.10%	0.20%	0%	0.80%	0.20%	0.30%
Other type of media	8.80%	0.30%	0.30%	1%	0.10%	6.40%	0.30%	1.20%
School	1.90%	0.60%	1%	0.20%	0.50%	1.40%	0.60%	0.70%
Radio	53.50%	40.80%	30.50%	41.70%	39%	52.50%	37.10%	39.40%
Meetings/training	31.80%	54.40%	62.10%	54.50%	58.90%	35.20%	58.50%	55.10%

Figure 17: Main sources of information on environmental issues

Source: (National Institute of Statistics for Rwanda, 2012b)

The Government of Rwanda through the Community Based Environment Health Promotion Programme, under the Ministry of Health, has encouraged the establishment of Community Hygiene Clubs (CHCs). A Community Hygiene Club (CHC) is a discussion group of peers from the same localities, who meet, identify their sanitation, hygienic and health problems or needs, and, through dialogue and using stimulant tools get engaged in identifying solutions together. The CHC approach appeals to the innate need for health knowledge, which is then reinforced by peer pressure to conform to communally accepted standards of hygiene, thereby creating a *culture of health*. Members can, for example, decide that after two months, all members shall have built a drying rack, or a standard latrine or a bathing shelter. The ideas and concepts originate from the members and implemented by them. The Government however, always comes out to give technical support and guidance.

At the City level, Kigali encourages citizens on putting in place a storage mechanism of rain water and septic tanks for sewage water with *effluent filter* to separate solid waste from sewage, and therefore the solid waste is deposited in the *soak pit*. It (Kigali city) has gone to considerable efforts to maintain the urban environment clean and plastic bags are forbidden within the city and the country as a whole. A new hygiene approach called *CELL BASED HYGIENE* is being implemented in Kigali and it increases community ownership and local leaders' participation. This started in 35 pilot cells which used to be the dirtiest. Hand washings campaigns are being done countrywide with the new approach *kandagira ukarabe* (Box 8) (Figure 18). This approach, being implemented by the Community Based Environment Health Promotion Programme under the Ministry of Health, is a campaign that has widely been commissioned across the country and embraced by Rwandans.

Box 8. Kandagira ukarabe approach

Kandagira ukarabe step and wash, is a system of encouraging people to wash their hands after the use of the toilets. It is a simple hand washing equipment where a small jar or container with clean water is positioned at the top and connected to a peddle that exerts pressure to open the flow of water from the container. At the base of the equipment, is an empty Jerry can connected to a sink by a plastic or rubber pipe that collects dirty water after washing hands. The dirty water is easily disposed of when full. Less sophisticated, 'step and wash' designs found in rural areas, only has a rope tied to a container (usually a small cut-open jerry can) that connects to a wooden peddle on the ground. When stepped on, the rope tilts the container downwards to wash hands. Dirty water usually flows into drainage or big bucket. The design behind of this simple technology ensures that those washing hands do not touch the contaminated handle of the jerry can. A bar of soap is positioned next to it

Figure 18: Kandagira ukarabe approach

At the individual level, it is important to highlight that most Rwandans households (96%) have already financed and built their waterless sanitary facilities (Ministry of Infrastructure, 2010), even if they do not yet fully meet the sanitary definitions of the MDGs, nor adhere to basic principles regarding waste disposal. There are also some initiatives to build a public toilet facility in less than a mile of every household. Thus, Rwanda Environment Care came with new innovative ideas to build public toilets (ecological toilets) in order to help the local authority in improving hygiene and sanitation within the City (Hohne and Dusingizumuremyi, 2011). Two other remarkable initiatives are taking place in Kigali: first, a resident scientist from KIST is now creating a showcase for the applicability of an inter-domestic network to produce biogas. He wants to connect about 150 households to three digesters with a total volume of 172m^3; the second initiative is a UDDT, set up by Meg Foundation, a UK based charity, in their primary school. In need of a new toilet, the head had heard of *Eco-San* through a friend and then found technical support through KIST. A local ornamental nursery is using the faeces for compost. Both initiatives are driven by their initiators' ideas and efforts (Alexandra Hohne, 2011).

CONCLUDING REMARKS

This report has reviewed what we know about sanitation in Rwanda and what we can learn from research on self-sustaining sanitation chains. In Rwanda, open defecation has practically been eliminated and most of Rwandan households have already financed and built their on-site private sanitation facility, and are now being encouraged to upgrade them to meet the international standard definitions of an improved sanitation facility. Major hotels, hospitals and some industries have installed their own pre-treatment systems. A conventional sewerage and treatment system for Kigali's centre is in the planning process. Treatment sites and wastewater treatment plants are lacking and often wastewater is discharged into natural water bodies and open canals. This lack of sanitation is one of the biggest causes of illness in Kigali. Despite this, the country is on track to achieve MDG target for water and sanitation and demand stimulation activities for sanitation in Kigali are developed.

Since 2000, Rwanda's schools have benefited from the HAMS (Hygiène et Assainissement en Milieu Scolaire, School Sanitation) program, which focuses on behaviour change in hygiene practice including considerations for menstrual hygiene. The Government Community Based Environment Health Promotion Programme (GBEHPP) is particularly focusing on the communities to impart the values of, and create the demand for, behavioural changes. A *CELL BASED HYGIENE* approach, community development programmes such as *umuganda, ubudehe, and imihigo* provide a way for people to increase their demands for improved sanitation. These programs are complemented by the existing decentralization process which provides an adequate framework for community participation and sensitization and allows households to carry out infrastructure investments on their own. There are also some upgrading programs which aim at improving the conditions of slums. In managing solid waste, the major towns are undertaking considerable efforts to maintain the urban environment clean. Plastic bags are forbidden within the bounds of the country.

Although there have been a number of initiatives to try to increase access to sanitation as well as to make use of the excreta, these home-grown initiatives have been affected by poverty levels. The majority of residents are poor and find it a challenge to finance the costs of sanitation facilities. Because of the illegal nature of the land, it is difficult for informal settlements dwellers to secure loans in order to finance their sanitation facilities. Also, the sanitation market is underdeveloped in middle and high-income areas and does not exist in informal settlements. Although the solid wastes services are provided by companies and Community Based Organisations; the service is not targeted to meet the needs of the poor in informal settlements. The problem becomes complicated with faecal sludge management. Indeed, as stated earlier, Kigali has no central treatment plant and the majority of liquid waste is being removed without any treatment. Re-use activities even if they exist, tend to be limited to prisons and are not affordable by poor-households. A sewerage system is being planned next year, but funding remains problematic. The creation of *Umurenge SACCOs* may improve the conditions of the poor but still, access to finance by the very poor is still limited. Will the plant be able to take the sludge from the latrines? There no clear strategy for pit emptying. Access to pit emptying machines in informal settlements is a challenge. This situation is exacerbated by the lack of qualified craftsmen, masons, artisans and adequate sanitary technology know-how. This situation would probably have been improved if regulatory framework was effective.

Rwanda has a significant number of legal and regulatory instruments; however, in terms of regulation, there is duplication of responsibilities as well as gaps and missing elements in the regulatory provisions for effective improved sanitation. Furthermore, the existing laws and policies are not always enforced and implemented. Enforcement of laws and policies in sanitation sector is difficult as the existing laws mainly apply to formal settlements. There is lack of clear separation of institutional roles on policy formulation, planning, implementation, and regulation on sanitation services in informal settlements. Therefore, during the fieldwork there is a need to explore the extent to which and ways in which self-sustaining chains can be applied in the City of Kigali.

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